TEXTILE WORLD RECORD

MAY, 1912

Monthly Comment.

A Public Conditioning House

The National Association of Cotton Manufacturers at its recent meeting at Boston adopted the following resolution looking to the establishment of a public conditioning house:

Resolved, That the president appoint a committee of five to take immediate steps for the establishment by this association of uniform, standard conditions under which tests shall be made on cotton cloth and cotton yarn, and the establishment of a public conditioning house under the control of the association where tests can be made under the conditions so adopted. This committee to draw up rules and prices for such conditioning house on the same general line as those of the Manchester Chamber of Commerce. The committee to have full power to go ahead in this work after submitting their plans to the Board of Government and obtaining their approval.

The testing house at Manchester, which is to be taken as a model, was established by the Chamber of Commerce of that city in 1895, and its facilities are open to all who conform to the requirements, regardless of whether they are members of the Manchester Chamber of Commerce or not. The regulations of the Manchester testing house are as follows:

All samples and goods are received for testing under the following conditions:

1. The Testing House is open for the reception of samples daily from Mondays to Fridays from 9.30 a. m. to 5 p. m., and on Saturdays from 9.30 a. m. to 11.30 a. m., except on holidays.
2. Payment of all charges must be made by the sender before the certificate of examination is issued, but deposit accounts may be opened by payment of a sum of not less than five pounds, in which case the charges are debited to the account, and a statement rendered monthly.
3. Every care is taken of goods and samples while in the Testing House, but the Chamber will not be responsible in case of loss or damage.
4. Interested parties may be present during the testing, but must obtain the written permission of a member of the Testing House Committee for that purpose.
5. All samples or goods must be delivered to and removed from the Testing House by the party ordering the test, but they may be forwarded by post at the sender's expense on his request.
6. The Manager may refuse any samples or goods for testing which in his opinion are unsuitable by reason of their size, weight, packing, or for any other reason that in his opinion might render the test unreliable.
7. Samples sent by post must be accompanied by payment of charges, together with twopence for postage of temporary acknowledgment and certificate.
8. Samples found to be too small to give a reliable result may be accepted for testing, but the certificate of examination will be endorsed "Sample below regulation size."

As its name indicates, the work of the Manchester Testing House includes not only what is known as the "conditioning" of materials, that is the determination of the weight of materials with the standard allowance of moisture, but also the testing of materials for a wide variety of purposes, such as the testing of yarn for strength, twist, elasticity and unevenness, the identification of fibers, and the analysis of fabrics, dyestuffs, drugs, mill supplies, coal and water. The most important branch of the work and

the one of greatest interest in connection with the project outlined in the above resolution is the testing of textile materials to determine the conditioned weight. For this purpose certain standards of regain are adopted for the various materials. The absolutely dry weight is determined and to this the standard allowance for moisture is added, the result being the conditioned weight. The European textile trade has adopted the following standards for the regain:

Worsted ..... per cent.	18¼
Carded woolen yarn	17
Flax and hemp	12
Cotton	8½
Jute	13¾
Silk	11
Shoddy yarn	13

These allowances are supposed to be approximately equal to the normal amount of moisture found in the respective materials. When they were adopted many years ago it made no difference what standards were adopted so long as they represented approximately the normal amount of moisture in the materials. For example, it would have made no difference whether the standard regain for worsted was then fixed at 18 1/4, 18 1/2 or 18 3/4 per cent., for the trade would have adjusted itself to any one of these standards with equal facility. Now, however, after the standards of 18 1/4 per cent. for worsted, 8 1/2 per cent. for cotton, and 11 per cent. for silk have been established for many years, at least seventy-two years in the case of silk, it is very important that any extension of this allowance for regain to other countries should be based on the standards that have been established in Europe. For this reason there should be no attempt to establish in this country standards different from those accepted in Europe. Such an attempt if successful would be a cause of constant confusion. It is, however, almost certain that the attempt would fail because of the fact that the European standards are not only firmly established in Europe, but are the standards that have been accepted for many years by the conditioning house at New York.

The German Jute Industry

The official returns from German mills using jute exclusively have recently been issued. Compared with the two preceding years they show a slight increase in production, the spindles in 1910 having increased by 3,020, as compared with 1908. Following is a summary of the statistics for the three years:

	1908	1909	1910
Mills	29	29	30
Spindles	164,373	164,925	167,393
East India Jute, lbs.	288,610,390	300,794,705	310,689,313
Yarn, single			
No. 8 and under, lbs.	291,526,499	304,072,661	310,266,422
Above No. 8, lbs.	4,128,318	3,488,117	4,187,896
TOTAL	295,654,817	307,560,778	314,454,318

The yarn count is English as that is the system of yarn numbering in general use in the German jute industry.

Decline of Wool Growing in France

A recent report by M. Valentin to the "Association generale du commerce et de l'industrie des tissus de Paris" states that the number of sheep in France has been steadily decreasing for the past forty years. In 1900 there were 20,000,000 sheep in France; 17,500,000 in 1909; and 16,000,000 in 1912. The decrease in recent years is ascribed to the ravages of diseases which have extended to the flocks in all parts of the country. The result has been a serious increase in the price of mutton. In 1892 and 1903 a high tariff was imposed on live sheep imported into France. M. Valentin is of the opinion that a repeal of these duties would give immediate relief, but the agrarian party in the French Senate and Chamber of Deputies refuses to accept that conclusion, assert-

ing that the high price of mutton is the result of general causes that affect all food products.

Freight Rates on Wool

Last month the Interstate Commerce Commission made a decision on the application of wool growers and shippers for lower freight rates from the West. The Commission decides that the rates now in force are excessive and orders that material reductions be made. A reduction of 5 1/2 cents per hundred from the Mississippi River to Boston is ordered; also 5 cents a hundred from points in Wyoming to Chicago. The new rates ordered by the Commission are 52 cents from the Mississippi to Boston; 44 1/2 cents from Chicago to Boston; and 80 cents from Wyoming points to Boston. These rates are increased 2 cents for every 25 miles in excess of the given haul. The rates given are for wool in sacks. Baled wool is to be carried for 15 per cent. less. The railroads will have until May 1 to adjust their rates to conform to the order.

A Standard List for Silk Weaving

After negotiations extending over several years the silk manufacturers and their operatives in the Macclesfield district of England have agreed upon a standard price list for power weaving. This agreement is notable in several respects. It is the first price list for power weaving ever adopted at Macclesfield. It is the first price list of any kind adopted in that district since 1849, when the list for hand-loom weaving went into effect. The power weaving list was adopted at a meeting of the representatives of employers and operatives held at Brooklands. The list includes twenty-six clauses, the prices being graded according to the fabric, and speed and style of machinery. There has recently been much discussion of how the silk industry of England can be revived. It is certain that the principle of industrial harmony involved in this recent agreement at Brooklands will prove of great importance as a basis for the development of the English silk trade. A similar agreement as to piece work prices has long proved one of the most valuable possessions of the Lancashire cotton trade. The example set by Lancashire and Macclesfield could be profitably followed by the American textile trade.

Mill Stocks of Cotton

The International Cotton Federation's report of cotton at the mills on March 1 includes returns from 123,564,126 spindles out of a total of 139,312,870 in all countries. The figures for March 1, 1912, compared with previous reports are as follows:

STOCKS AT FOREIGN MILLS.

Date.	Returns, Spindles.	Bales on hand.	Bales used per week.	Stocks will last
Aug. 31, '05	46,726,929	935,237	103,269	9 weeks
Mar. 1, '06	54,297,537	1,237,120		
Aug. 31, '06	66,072,303	1,210,610	145,603	8.3 weeks
Mar. 1, '07	71,054,503	1,911.071		
Aug. 31, '07	74,279.078	2,368,410	190,811	12.4 weeks
Mar. 1, '08	78,984,106	2,342,127		
Aug. 31, '08	83,371,883	2,132,045	215,472	9.9 weeks
Mar. 1, '09	85,906,697	2,425,127		
Aug. 31, '09	88,188,004	2,275,392	222,740	10.2 weeks
Mar. 1, '10	91,154,411	2,492,688		
Aug. 31, '10	91,124,025	2,005,786	236,990	8.4 weeks
Mar. 1, '11	93,726,091	2,641,688		
Aug. 31. '11	92,405,197	2,096,052	252,365	8.3 weeks
Mar. 1. '12	94,041,529	2,657,413		

STOCKS AT AMERICAN MILLS.

Date	Returns, Spindles.	Bales on hand.	Bales used per week.	Stocks will last
Aug. 31, '05	23,687,495	776,801	82,288	9.4 weeks
Aug. 31' '06	25,250,096	688,312	94,413	7.3 weeks
Aug. 31, '07	26,242,000	996,000	95,904	10.4 weeks
Mar. 1, '08 est.	27,000,000	1,089,119		
Aug. 31, '08	27,846,000	596,000	87,981	6.4 weeks
Mar. 1, '09	27,846,000	1,831,800		
Aug. 31, '09	27,783,000	908,000	97,788	9.3 weeks
Mar. 1, '10	28,000,000	1,674,000		
Aug. 31, '10	28,349,000	518,000	90,519	5.7 weeks
Mar. 1, '11	28,500,000	1,525,000		
Aug. 31, '11	28,872,000	523,000	90,308	5.8 weeks
Mar. 1, '12	29,522,597	1,543,000		

The Federation's statistics of mill stocks and consumption of cotton increase in value with each report, giving the cotton trade information that must have an important influence in preventing speculation. As we recently pointed out, this feature of the Federation's work could be advantageously copied in the wool trade. The Boston Wool Trade Association has made a good beginning by reporting the stocks of wool at Boston.

Cotton Tare

The inquiry into the method of packing American cotton, which was made some months ago by order of Secretary of State Knox, has met with favor in some quarters, as the following from the Mitteilungen ueber Textil-Industrie shows:

French cotton spinners are interested in the question of cotton tare, particularly in the allowance of 6 per cent. The "Journal of Rouen" some time ago published an article advocating the net weight basis for the trade in raw cotton and pointed out that under the present system every bale of 500 pounds carried 30 pounds of iron bands and inferior bagging. It is stated on excellent authority that the recent inquiries regarding cotton made by American consuls at the request of Secretary Knox met with warm approval at Havre, as it was understood that the inquiries were made for the purpose of establishing a net weight basis for the cotton trade. It is, however, for the interest of the cotton dealers at Havre to maintain the present system by which the bale is opened in different places for the purpose of sampling the cotton. The weight lost in this way is then made up by the additoin of inferior bagging and iron bands. This additional material is then sold to the spinner as cotton. Under the new regulations proposed by Secretary Knox the spinner would be called upon to pay only for the cotton he received.

The item quoted above does not tell the whole story. In many cases it has been proved that the allowance of 6 per cent. (30 lbs. per bale of 500 pounds) is in excess of the actual tare, with the result that the foreign buyer gets the difference in cotton without paying for it. This may explain the lack of any really determined effort by foreign spinners to establish the raw cotton trade on a net weight basis.

COTTON GROWING IN EGYPT

From a Report by Arno Schmidt, Secretary of the International Cotton Federation.

Mr. Schmidt recently visited Egypt to make arrangements for an excursion to that country by members of the Federation. On his return to Manchester he prepared a report of his observations, from which we take the following extracts:

The modern history of cotton in Egypt dates from 1820, when a French engineer, called Jumel, who had recognized the possibilities of improving the cotton crop in Egypt, succeeded in interesting Mohammed Aly in the subject. The new Jumel cotton, as it was afterwards called, was a tree cotton which Jumel had found growing for ornamental purposes in a Cairo garden, and the cultivation on a large scale was soon shown to be a commercial success. The results encouraged Mohammed Aly in further experiments, and he began to import foreign seed, principally Sea Island and Brazilian. The result has been the gradual development of a cotton which is distinctly Egyptian, and which, through many different varieties, possesses the characteristics which have given it a special value.

Its importance as a part of the world's supply was first established during the Civil War in America in 1864, when the price of Egyptian cotton rose to an unprecedented level. The subsequent relapse to something like the old prices contributed largely to Ismail's early financial difficulties. In 1894 the price fell below seven dollars per kantar.

AGRICULTURE

It seems necessary to explain that one distinguishes the crops in Egypt between winter, summer, and Nile crops, i. e., crops of which the seed is sown in winter, summer, or directly after the flood. Cotton is, of course, the most important crop of the country. Large estates are using steam ploughs, but the small cultivator prepares the ground in autumn by means of the primitive Egyptian plough, drawn by a pair of oxen. I have seen as many as twelve ploughs in one field at the same time. The plough is made entirely of wood; only the front part of the beam which goes into the soil is shod with iron.

The plough does not cut deep into the soil, but simply scratches it; the fellah will generally plough his field four times, sometimes oftener, each ploughing being done at right angles to the previous one. When making ridges for cotton, the beam edge of the plough which goes into the soil has to be covered with sacking, as the ordinary plough does not throw up the soil. There is in use a ridging plough, called "battana."

After the ridges have been made in this primitive manner, a number of men shape them properly by means of a "fass," an instrument in the shape of a Dutch hoe; these

men also attend to the breaking up of clods. It is estimated that the cost of one pair of bullocks and the labor is about a dollar a day; the extent of their work is about 2 1/2 acres. The native plough does not enter the soil deeper than 5 to 6 inches; cotton which has a deep tap root, two yards and even more in length, requires the soil well loosened.

MANURING

Owing to the more intensive cultivation of the soil since the introduction of perennial irrigation, and also owing largely to the fact that there is at present very little Nile mud deposited on the land, whilst formerly at flood time, when basin irrigation was in general use, there was every year the restorative power added to the soil by the Nile mud, the question of adding manure becomes more and more acute. The heaps of manure which one sees at every village are a proof of the value which the native puts on it; every cultivator in Egypt acknowledges the value of the manure as far as the cotton crop is concerned. The opinion is still held that stable manure is the proper dung for the cotton crop in Egypt; artificial manures have proved only a success on very poor soil. The mixture recommended by Mr. Foaden is 10 to 15 tons stable manure, 150 or 200 pounds soluble nitrogenous manure, and two-thirds nitrate of soda and one-third sulphate of ammonia. Comparatively speaking, few cultivators are using chemical manures for the cotton crop.

PICKING COTTON

During the latter part of August, cotton picking commences as far as Upper Egypt is concerned, where only Ashmouni cotton is grown. In September the first picking begins in the Delta, or Lower Egypt. The picking is carried out by children, boys and girls, and also old people, who put the cotton gathered into the folds of their loose smock. The pickers certainly cannot carry in this way as much cotton as the pickers in America with their trailing sacks over their backs. I have watched these children carefully separating fibers from leaves; where the latter will not readily become detached and fall off, they put the cotton into their mouth and blow the leaf or part of the stalk away, a process which they perform very quickly. To every ten or twelve children there is an

PREPARING LAND FOR COTTON.

overseer, and I have seen some of them using their lashes among the children who had left cotton on the plants. The average quantity picked per day by one child is about 30 pounds; picking cannot be carried out in the morning owing to heavy dews, and night falls at 5 p. m.

At the side of the field a long piece of can-

A WATER WHEEL.

vas is stretched out and the cotton of each picker is weighed and put into the farmers' long bags and carried away on the backs of camels. The wages earned by each picker are from ten cents a day upward. The cotton from each picking is kept carefully apart. There are generally three pickings, in some places only two, but in others even four. After each picking the field is watered. The first picking is of the best quality, more even than the others, and generally begins in September. The second takes place in October, and the last may be as late as December.

The seed for sowing purposes is taken from the first picking only. Before the last picking clover is frequently sown among the cotton, and as soon as the crop is finished the sticks and roots must be pulled out (according to Government decree not later than December 31st). After this the land is usually leveled for the water to reach evenly all parts of the clover.

THE NILE AND IRRIGATION

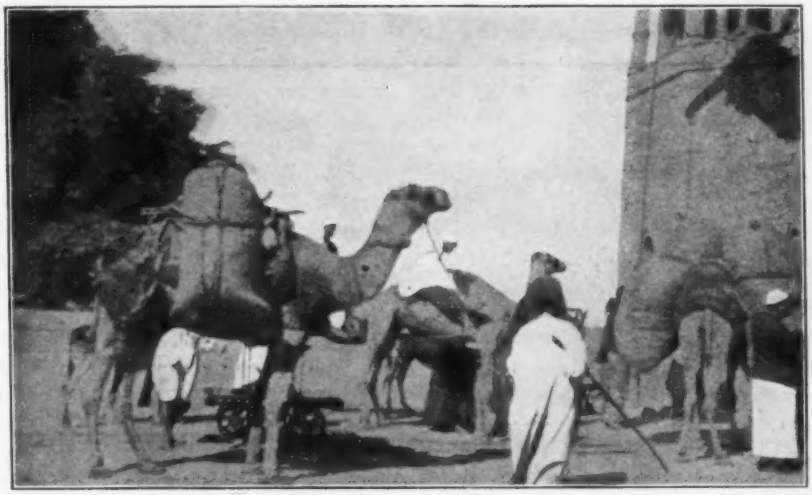
The White and Blue Nile join close to Khartoum and form what is known as the Egyptian Nile. From Khartoum to the Mediterranean it is 1,875 miles in length, but receives only one tributary, the Atbara. The Blue Nile and the Atbara have their sources in the mountains of Abyssinia. The White Nile rises in the large lakes of Central Africa. While the Blue Nile and the Atbara are in flood from August to November, flowing quickly and carrying with them the soil from the Abyssinian highlands, where owing to the heavy fall the water does not soak into the soil, the White Nile has its flood time in the early summer.

In order to guarantee a sufficient supply of water in the Nile during the summer before the flood came, a huge storage reservoir was constructed at Assuan, and a barrage at Assuit. This has rendered possible the conversion of the basins of Upper Egypt into perennially irrigated land. The Dam at Assuan, which together with the first Nile Cataract forms this reservoir, was constructed by John Aird & Co. It has a height of 528 feet, and a length of 6,500 feet; there are 140 sluices below, each 66 feet square, and 40 upper sluices of 24 1/2 feet. The bottom sluices allow the silted water to pass when the river is in flood. The dam is at present being raised 20 feet in order to allow of sufficient additional water being collected for a further 1,500,000 acres in the north of the Delta, which at present lie unreclaimed. When the flood ceases the sluices on the Assuan Dam are closed. This is generally about the 1st of December, and it takes 100 days to fill the huge reservoir. Towards the beginning of May the water in the Nile be-

comes too low to feed the extensive network of canals, and from that time the water from the Dam at Assuan is used, the contents of which, amounting to 1,300,000,000 cubic yards, are necessary for supplying about half a million acres in Upper Egypt with water. The cost of the Assuan Dam and the Assuit barrage was $17,000,000, and the additional 20 feet height will cost $250,000, while the work necessary to protect the antiquities at the island of Philae will cost $5,000,000.

R. Lang Anderson, managing director of the Aboukir Land Company, in the articles he has contributed to the excellent Text Book of Agriculture, issued by the Ministry of Education, says, with regard to the Assuan dam: "There are now 886,900 acres in Upper Egypt cultivated during summer in sugar cane, cotton and durah (maize), and when the Nile reservoir at Assuan has been heightened the area receiving perennial irrigation will be greatly increased and the basin system will practically disappear. Instead of completely abolishing the basin system it would be more judicious from an agricultural point of view to so divide the basins into two, that summer cultivation could be confined to one-half in alternate years, while the other half could be flooded, as is now done, but in alternate years. In this way all the land would have a thorough renovation with rich Nile mud every second year, and the noted fertility of Upper Egypt would be maintained."

Where there is irrigation there ought to be adequate drainage; drainage channels permit the filtering through of fresh water to remove noxious salt, they dry the land and leave it in sounder condition to feed vegetation, and they prevent the subsoil water from being raised too high; in short, a thorough system of drainage would prevent water-logging. As everything tends to point to this water-logging as being the cause of deterioration, the Government will, I feel sure, devote increased attention to the drainage of the country.



TRANSPORTING COTTON BALES TO THE GINNING FACTORY.

GINNING

I visited six ginneries, including the most up-to-date factories. From entering the factories until leaving them I was very much astonished at the unnecessary waste of labor and wages. In comparing the arrangements of an Egyptian ginnery with an American one, one cannot but be impressed with the antiquated methods in use. Yet these ginning factories are in the large majority of cases owned by old-fashioned and wealthy European firms. When I pointed out the

useless increase in the cost of production of Egyptian cotton, I was told that reforms such as suction pipes as the means of transporting cotton has frequently been considered, but never any definite action taken, as it was feared the long staple cotton might suffer in the carrying by suction pipes. I replied that the spinner uses these pipes when the cotton comes to the mill, and he would not do so if he found any damage to the staple. Another argument in favor of the antiquated method was that wages in Egypt are much cheaper than in America. Quite so, but if the cost of production can be reduced, it ought to be done in the interests of the industry, and wages in Egypt have considerably advanced and will still further be raised, especially when schooling becomes more general, and the vast amount of child labor ceases. The cost of living has already gone up, and wages are not going to be on the same low level.

There are about 3,000 to 4,000 gins in Egypt, belonging to about 140 factories; the gin in common use is the Macarthy roller gin, made by Platt Bros., Oldham. The Associated Cotton Ginners of Egypt, which firm has recently been formed by some of the most prominent houses in Lower Egypt, owns some 1,200 gins, or about one-third of the whole. The shareholders of the ginneries are in most cases the large cotton shippers in Alexandria.

The ginning factory stands in a large yard, often six acres in size; during November and December these yards are filled with cotton bales. The bales are unprotected, and are exposed to the weather; but as rain seldom falls, this is not a great disadvantage. Although there is frequently a heavy dew the sun soon dries it up. The shoonah or store proper is in many cases some 30 yards away from the ginnery. There the long bales as they come from the cultivator are opened and roughly examined; only one class of cotton is kept in the store room at one time. After examination the cotton is put on a large canvas sheet, and a man taking the four corners in his hands carries the cotton, weighing about 200 pounds, across on his back; cotton, of course, drops off, and although someone follows and picks up the fallen cotton, there must be some loss, and certainly dirt gets into the cotton. To prevent the latter a piece of canvas is stretched out from store to factory. In some cases the cotton bales are brought directly into the ginnery; a man carries one bale with great difficulty up the incline to the ginnery, which is always somewhat high. The carrying of these bales, owing to their ungainly shape, is a most difficult process, requiring great physical strength. The bales weigh as much as 400 pounds, but the weight-carrying ability of the Egyptian porters is phenomenal. Such antiquated methods would not be tolerated in Lancashire, on the Continent, nor in the U. S. A. The price paid for carrying one bale from the yard into the ginnery is quite a considerable item.

Behind each gin there is a box for the seed cotton. This box has to be constantly filled by special men. In one ginnery only had they an automatic feeder. When the cotton is ginned it drops into a box and a huge box cart running on rails is then brought along and the ginned cotton is loaded into it by about eight men and taken to the press. To anyone who has seen an American ginnery this seems a shocking waste of labor. Why should not suction pipes deliver the seed cotton to each gin from the store and from each gin to the press? A suction pipe for transmitting the ginned cotton from the gin to the press is a simple contrivance costing comparatively little. Such pipes should also be used for conveying the seed cotton from the store to the ginnery.

Ginning factories during the season, when there is a large crop, work day and night; they begin running in August and finish in January. When I visited the ginneries they were working only 15 hours per day. The following notice (verbatim) was posted up at Messrs. Choremi Benachi & Co., Beni-Suef:

> "Working hours: 15; in full season day and night work by changing every 12 hours the workmen. Age children 14 years."

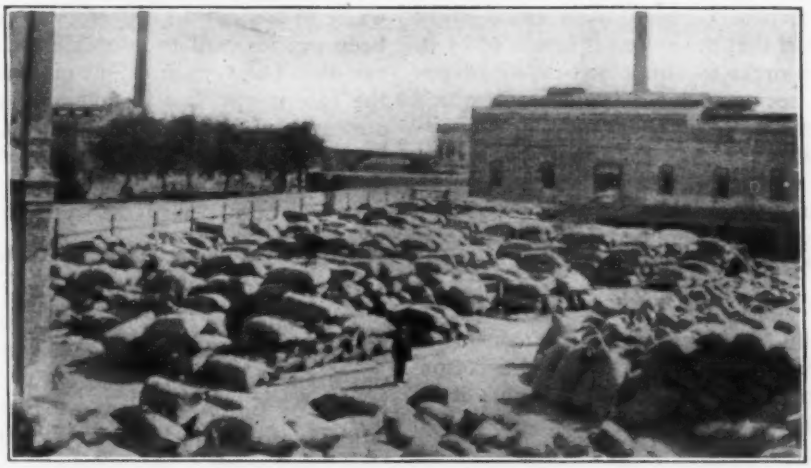
On the State Domains in Korashia the labor in connection with ginning is contracted out. A contractor supplies the necessary hands and receives 7 cents per hundred pounds of

cotton ginned, the Domains finding only the gins, driving power, coal and the engineer.

WATERING COTTON

When the ginned cotton arrives in the pressing room, all the cotton is scattered over the floor, which is constructed like a sieve; the cotton is thrown up in the air by about ten men, an overlooker giving the word of command. This process shakes the dust to a certain extent out of the cotton. After about two minutes' shaking the men stand still and the cotton is watered in the following way. I noticed one, in some cases two men, each provided with a garden syringe, about 2 inches in diameter and almost 2 feet long, emptying, sometimes twice, sometimes once, the syringes over the cotton from a fixed water tank. No secret is made of this artificial damping of cotton. With the exception of the factories on the Domain Estates, I was told all the ginneries water the cotton, and certainly I have seen it done openly in the largest concerns in Egypt. I was informed that one ginnery has an ingenious system of sprinklers attached to the box cart which collects the cotton from the gins; as this cart passes the gins, water is sprinkled over the cotton as soon as it falls from the gin. The cotton is shaken twice and watered twice, then it goes to the press. If suction pipes were used the ten men would not be needed, as the dust is then blown away automatically.

I had considerable argument with the owners of gins as regards this watering. First I was told it is an absolute necessity, because if it were not done the spinners would constantly complain as to inferior quality. I admitted that the cotton "pulls" better when somewhat moist, but maintained that the spinner would prefer to damp his own cotton if he wanted it to "pull" well, than to pay somebody else about $1.50 per bale at the least. Another gin owner said



THE YARD OF A GINNING FACTORY.

watering improves the quality, but I cannot see that a fiber separated from its nourishing point, the seed, can be improved by water, but if it is improved, why should not the spinner do this watering himself and save the money? Another reason stated was that the cotton would not press to the required density if it were not watered. I asked two men of practical experience in pressing, and they told me that the damping was not required for the sake of pressing the bales.

I may mention here that the ginner, or shipper, when he buys the cotton from the grower, deducts regularly 1 per cent. of the weight for damp and samples; but in buying from the Domain Estates no such deduction is allowed. I am not aware that the spinner receives any such allowance from the Alexandria shipper as a regular condition, al-

though the latter has put more damp into the cotton which he bought, subject to the allowance. I was told that cotton is sometimes artificially damped by the fellah, and that the ginner has to let the cotton lie for several days before he can gin it. In such cases the ginner fixes the allowance, which, I was told by a manager of a large gin, the native generally accepts without question.

While pointing out to the spinners the artificial damping in the process of pressing, I feel it my duty to mention that I am convinced the ginners (respectively the cotton shippers, who are in most cases identical with the ginners) continue this method solely in the belief that the cotton is benefited by it, and not in order to obtain any unfair advantage. It seems to me a trade usage which has become thoroughly recognized, the wisdom of which, however, from the spinner's point of view at all events, seems open to discussion. When the spinners' delegation visits Egypt this would certainly be an interesting subject for discussion.

PRESSING

Generally speaking Egyptian cotton is baled three times. First when the cotton comes from the field the grower puts it in sacks of about 400 pounds. After ginning it is made up in hydraulically pressed bales of about 700 or 800 pounds. For this purpose box presses are used; two or three boxes are on a turning disc; while one bale is being pressed the other two are being filled. Only a few of the presses I inspected had the usual system of piston pressing while filling the boxes with cotton; in most cases as many as six men kept stamping the cotton down with their feet in the box. When the box was full they drew themselves up on ropes suspended over each box. Here again waste of labor.

After being hydraulically pressed the bale is usually sent to Alexandria, where it is opened again, examined, watered and pressed this time by steam, to the well-known ecellent shape. In isolated cases the ginneries in the country have besides the hydraulic press a steam press. Strange to say, even there all bales are first pressed by the hydraulic press and covered with canvas and hoops, and on the very next day they are opened again and finally pressed by steam. I inquired at the two gins where hydraulic and steam presses are kept, for the reason of this apparently unnecessary first pressing; in one case I was frankly told that the hydraulic press serves for the equal division of the moisture; in the other factory, no reason was given, except that it was the custom. Why the hydraulically-pressed bale is covered with canvas and hoops and stitches when it is to be opened again in 12 hours I cannot understand.

This twice pressing seems, at all events, a waste of labor; no satisfactory argument has been put forward to convince me of its necessity. The very firm that gins and presses the bale in the first instance has ample opportunity of inspecting the cotton, and it is in most cases the same firm in Alexandria that sells the cotton to Europe.

The National Association of Cotton Manufacturers

The following papers were unavoidably omitted from the report of the meeting of this association: Transmission of Power by Ropes, by Edwin Kenyon; An Electric Conditioning Oven, by Henry W. Buhler, and Cotton Growing in Egypt, by Arno Schmidt, secretary of the European Cotton Federation. Mr. Buhler's paper will appear in our next issue, and copies of the three papers can be obtained on application to Secretary Woodbury. The many friends of Secretary Woodbury were pleased to see him on duty again and to know that he had recovered from the severe illness of the past winter.

President Hobbs entertained the Board of Governors and the speakers at the Convention on Wednesday evening at dinner at the Union Club in Boston. In addition to these guests, members of the visiting delegation from German Boards of Trade, who were in the city, were also present. The occasion had a distinctly international flavor, as representatives of Great Britain, Germany, and the United States discussed problems of mutual interest.

The National Association of Cotton Manufacturers

An audience that filled Paul Revere Hall was in attendance when President Hobbs called the annual meeting of the National Association of Manufacturers to order on April 24. After the reports of the secretary, treasurer and auditor had been read the medal committee, consisting of Messrs. Burleigh, Cramer, Dawson, Eccles, Hooper, Kuffler, Makepeace, Manning and Meier, made its report, awarding this year's medal to President Franklin W. Hobbs for his address delivered at the meeting held at Manchester, Vt., last fall. Chairman Burleigh in presenting the medal said that the committee had encountered great difficulty in deciding between so many valuable papers, but

EDWIN FARNUM GREENE, NEWLY ELECTED PRESILENT.

had finally concluded, in view of the exceptionally able manner in which President Hobbs had defended the industry against the attacks upon it, to award the medal to him. In his response accepting the medal President Hobbs thanked the association for the honor and expressed his gratification because of this mark of appreciation of his efforts in defense of the cotton trade.

An address of welcome was then delivered by the Mayor of Boston. Mayor Fitzgerald referred to his interest in the welfare of the cotton industry as shown by his work in Congress and as Mayor of Boston, and promised to cooperate with the manufacturers in the future in promoting all measures designed to benefit the cotton trade. Mayor Fitzgerald then discussed the duties and responsibilities of the cotton manufacturers in their relations with their operatives. He referred to the recent strike at Lawrence and said it was evident that the mill owners had neglected their duty in the past. He said the State should not be relied upon to maintain the militia in manufacturing districts in order to maintain order, but that the manufacturers should take an intelligent interest in their operatives, and by wise management prevent a repetition of the Lawrence trouble.

The response to Mayor Fitzgerald's address was made by William A. Erwin, of West Durham, N. C., who is president of the American Cotton Manufacturers' Association. President Hobbs then delivered his address, which was in part as follows:

PRESIDENT'S ADDRESS

By FRANKLIN W. HOBBS, Brookline, Mass.

The past year has been a most unsatisfactory one for those engaged in our industry. Few mills earned dividends; most mills which paid dividends took them from surplus accumulations of other years and many mills were compelled to pass dividends entirely. Extensive curtailment was the rule, but many mills were run at a loss in order to keep operatives employed and organizations together. The results of the year 1911 throw a strong light on the condition of the industry and give a most effective answer to ignorant or malicious talk about the enormous profits of the business. I am happy to be able to add, however, that it now looks as if the long period of depression which we have just suffered is at an end and the outlook for the immediate future, at any rate, is encouraging. Unfortunately, we have ahead of us uncertainty in connection with tariff legislation and the upset in business which is inevitable in a presidential election year, and no one can predict the effect these two disturbing factors will have on our industry and on the business of the country as a whole. Let us hope, however, that the improvement which has begun, may continue and increase until once again every spindle and every loom is running, and that as a result, stockholders and operatives may enjoy a period of contestment and prosperity.

LABOR TROUBLES

There have been two great textile labor troubles during the past six months, one in England and the other in New England. The one in England was settled by a truce between employers and employes, and during its existence it is believed that the differences will be adjusted. The trouble in New England started at Lawrence and at first involved only a question of wages, but later became much more serious, fundamental questions were raised and the agitation spread all over New England. An increase of wages is apparently bringing these unhappy conditions to an end and it is to be hoped that the industry will be free from labor troubles for some time to come.

THE WORLD'S CONSUMPTION OF COTTON

A year ago your attention was called to the question of "The World's Supply of Cotton," and it would seem that now we may profitably consider a few facts in conneition with "The World's Consumptios of Cotton."

From the United States Census Bureau we find that the number of active cotton spindles and the mill consumption of cotton in the various countries of the world during the year ending Aug. 31, 1911, are shown by the following table.

WORLD'S ACTIVE COTTON SPINDLES AND MILL CONSUMPTION OF RAW COTTON, 1911

United States	Active Spindles	Mill Consumption Bales
Cottos-growing states	11,077,000	2,328,000
All other states	18.438,000	2,377,000
Total	29,515,000	4,705,000
United Kingdom	54,523,000	3,782,000
Germany	10,480,000	1,685,000
Russia	8,672,000	1,625,000
France	7,300,000	960,000
Austria-Hungary	4,564,000	749,000
Italy	4,282,000	790,000
Spain	1,853,000	315,000
Switzerland	1,481,000	100,000
Belgium	1,327,000	217,000
Portugal	476,000	65,000
Netherlands	431,000	79,000
Sweden	528,000	95,000
Denmark	80,000	21,000
Norway	74,000	11,000
Other European countries	200,000	60,000
British India	6.250,000	1,650,000
Japan	2,180,000	1,060,000
China	831,000	350,000

Brazil	1,000,000	370,000
Canada	855,000	119,000
Mexico	630,000	140,000
All other countries	260,000	65,000
Total	137,792,000	19,013,000

From the above it will be seen that the number of active cotton spindles in the world was 137,792,000; an increase since 1900 of 32,111,000 spindles or 30 per cent. In addition to the above there were 1,281,000 spindles in the United States that were not running during the year 1911, and it is estimated that the number of inactive spindles in the world was 3,000,000, which would make the total spinning spindles in all countries about 141,000,000.

It will also be seen from the above that the mill consumption of cotton for the year ending Aug. 31, 1911, was 19,013,000 bales, as compared with 18,321,000 in 1910 and 19,397,000 bales in 1909. These figures, however, do not include the actual total consumption of cotton, for in some countries large quantities are grown and consumed without entering the world's markets and definite figures cannot be obtained for these amounts. It is estimated, however, that the total consumption of cotton during the year ending Aug. 31, 1911, was 300,000 bales more than the production of cotton from the crop of 1910. During the past year, however, the mills were not running full and in 1909 when the production was more nearly normal the consumption was 384,000 bales greater. Taking into account the total number of spindles now in the mills of the world, it is estimated that if they were all running full time the consumption of cotton would be practically 21,000,000 bales. The United States supplies about two-thirds of the world's consumption of cotton and in general the world's consumption varies with our production. It would seem reasonable to believe, therefore, if conditions are anywhere near normal, that an American crop of from 15,000,000 to 15,500,000 will be consumed in the mills during the year ending Aug. 31, 1912.

Furthermore, assuming all the spindles of the world were run at maximum production for one year, I repeat my query of a year ago: "Where will the additional amount of cotton needed for the world and its increasing population come from?" I cannot too strongly impress upon our people the necessity of studying and solving this great problem in order that we, as a nation, may maintain in the future our unquestioned supremacy in the raw cotton production of the world.

STANDARD TARE ON COTTON BALES

Through the agency and active work of Hon. William G. Brantley of Georgia, the Secretary of State, Hon. P. C. Knox, has caused a thorough investigation to be made, by the United States consuls, as to the practice with reference to "Tare" in foreign markets. Mr. Knox reported:

"It is apparent that the net returns obtained by American cotton growers under existing methods employed in baling are less than they would be were the cotton better prepared for market. . . .

"I had the honor to suggest the advisability of legislation identical on the part of all the states interested in the production of cotton to the end that uniform methods might prevail in the preparation of cotton for shipment whereby the weight in kinds of bands and coverings would be standardized throughout the South. The result of the present investigation appears to me convincing that concerted action on the part of the cotton states providing legal standards for the 'tare' of cotton would remove the cause of the loss now borne in the marketing.

"The producers of other nations, now supplying nearly 40 per cent. of the cotton imports required by the world's great consuming markets, have so standardized and perfected their methods of baling that the ultimate buying is content with such an allowance from the gross weight of the bale as is represented by the actual weight of the iron bands and the covering. The arbitrary charge for 'tare' against cotton of American production apparently can be overcome only when the American bale is standardized. When this is accomplished there will exist no incentive for an excess allowance, since it appears that foreign buyers are willing to buy on the terms of actual 'tare' when this can be arrived at readily with a reasonable certainty."

The Department of State has made a comprehensive report on the whole subject of tare and the various kinds of coverings used. It is indeed humiliating to Americans to be informed by their own government that the cotton producers of other nations handle the product better than those engaged in the same business here, and it is to be hoped that in the near future, positive action will be taken by the growers along the lines suggested.

COTTON CONFERENCE

A conference was held on Oct. 28, 1911, in the board-room of the New York Cotton Exchange, at which were present representatives of the New York Cotton Exchange, New Orleans Cotton Exchange, Memphis Cotton Exchange, The American Cotton Manufacturers' Association and The National Association of Cotton Manufacturers, and various matters in connection with the exchanges and their relations with the manufacturers were discussed.

The question of the adoption by the New York Cotton Exchange of the government standard types was very fully considered. Attention was called to the fact that, at the time the present government standards were prepared, a request was made to have types taken from both Gulf and Upland cotton, for the latter has been the basis of all trading on contracts for future delivery of cotton. Unfortunately, the Bureau of Plant Industry was unable at that time to get any cotton from the Upland or Atlantic States for these standards, and, as it seemed urgent to make some standards, the ones adopted were made only out of Memphis, New Orleans and Texas cotton. It is believed, therefore, to properly provide for trading in cotton grown in the Atlantic States, there should be a set of standard types made of Upland cotton and resolutions were passed, at the conference referred to, requesting the Department of Agriculture to prepare a standard set of samples to conform to the present standards but made of Upland cotton. These resolutions were duly presented to the Secretary of the Department and

the officials of the New York Cotton Exchange also have urged action along the line indicated, but I regret to report that so far nothing has been done. We shall continue to advocate the matter and every effort will be made to secure favorable action in the near future.

As a result of the conference, the New York Cotton Exchange have amended their by-laws so that, beginning in February, 1913, there will be an additional and third revision each year of the allowances for the differences in grades of cotton delivered on contracts.

The New York Cotton Exchange was also requested to specify on its certificates the numbers and classification of the grades of cotton covered. This is a somewhat difficult matter to work out without increased cost, but it is under careful consideration and favorable action is expected in the near future.

A NATIONAL ORGANIZATION

Over a year ago, at the invitation of your Board of Government, a conference was held in Washington with the officers of The American Cotton Manufacturers' Association, and at that time it was suggested that, while each association was doing good work in its own field and amalgamation was undesirable, it would be well to have some small representative body made up of officers or members of the two associations which could meet, as often as necessary, to consider national matters of vital importance to both associations.

It seems clear to me that a joint meeting of the two associations would be unwieldy and unwise, but I favor the organization of a small central body along the lines suggested.

THE ASSOCIATION

In my address last year I called attention to the fact that the Board of Government had decided to return to the original dues of the Association, fixed by the by-laws since its establishment, although the assessment of late years had been abated in part, and it is now a pleasure to be able to state that on account of those changes the Association is on a firm financial basis and also has the strongest membership in its history. The Association has completed another successful year, and its work has been carried on with increased activity along many lines, old and new, and I hope with better results than ever.

I yield to none in my appreciation of the good work that already has been accomplished, but I believe that, with increased income and numbers, the time has come to take an even more active and aggressive position in all matters connected with the industry and that, while continuing all its present lines of work, there is a great opportunity to broaden the scope of its activities along new lines and thus make the Association a greater power than ever in all questions related, directly or indirectly, to the manufacture of cotton.

MILL HYGIENE

There has been so much talk of late about the unhealthful conditions under which the textile industry is carried on that it seems well to state a few facts and thus contradict the misstatements that have been made in the attempt to prejudice the public against our business. We find contented, happy, well-paid people working in large, clean, well-lighted, well-ventilated rooms, amid healthful surroundings, far better in every way than their homes and the healthiest places they are ever in.

The laws of Massachusetts require in the public schools 300 cubic feet of air space per pupil and 30 cubic feet of fresh air per minute per pupil. In a spinning mill in Lawrence, Mass., there are actually 3,000 cubic feet of air space per operative in the mill and the ventilating system furnishes 50 cubic feet of fresh air per minute per operative—air which is cooled in summer and warmed in winter. You will note that the operatives are furnished ten times the air space and nearly twice the amount of fresh air per minute which is required by law for the school children of the state. One of the state medical inspectors, who has made a great study of hygiene and health conditions among all classes of people, recently told me he would state without hesitation and with knowledge gained by actual investigation, that the hygiene conditions in many Massachusetts mills are better than those in any schoolhouse in the state. These are facts but, unfortunately, many well-meaning people, utterly ignorant of the facts, have proclaimed so loudly, in season and out of season, that a textile mill is not a fit place for men and women to work in, that the public has begun to believe it is so. If our philanthropic friends would take the time and trouble necessary to get at the facts, I am sure they would agree with me that the legislators would better turn their attention for a time to the conditions existing in the homes of the operatives and attempt to bring them up to the high standard already found in the mills.

Let us consider the following facts: The modern factory has abolished the sweat shop; the regular life and hours have, of necessity, lessened dissipation; there can be no over-crowding from the very nature of the machinery; labor laws have greatly reduced the hours of work; all sorts of devices lessen hard labor; each new machine not only lessens labor but enables men to earn their livings in less time; it was the necessity of our mills that first made possible the development of humidification and cooling of air which now gives comfort to the afflicted in our hospitals; the incandescent electric lamp was also a development caused by the demand of the mills for a light which would not vitiate the air and which could be placed where needed; libraries, rest-rooms, lunch rooms and Y. M. C. A. rooms are found everywhere; a higher standard of living exists; the best sanitary and hygienic conditions known are found in the mills. It will be seen, therefore, that the modern factory life does not injure mentally, morally and physically those who are a part of it, but that the contrary is true, and that the modern factory system has been instrumental in lifting the life of the people to a higher plane.

SCIENTIFIC EFFICIENCY MANAGEMENT

It is needless for me to tell you that every cotton manufacturer is being constantly importuned by those claiming to be able to obtain for him extraordinary results in manufacturing through the

use of what is known as "Scientific Efficiency Management."

I am afraid that, as a result of these indiscriminate claims and statements of inefficiency, the idea has gone broadcast that the great industries of the country are in a bad way and that mismanagement and inefficiency are the rule. We know that such is not the case, and I believe that the manufacture of cotton is carried on in a remarkably efficient and scientific manner, more so than almost any other industry in our country. We fully understand that there is always a chance for improvement, and will at all times welcome suggestions and ideas that will still further advance the real efficiency of our industry. We have, however, long appreciated and felt the need of the highest grade of skill and the most watchful care in the management of our business and I am certain that every up-to-date concern engaged in the manufacture of cotton has for years studied and applied the basic principles of this much heralded cure-all, which it is now claimed will revolutionize all business.

We must, of course, in all things keep abreast of the times, keep our labor and machinery at maximum production and efficiency and thus keep down our cost and improve our product. It is no disparagement, however, to the skill needed in every process in the actual manufacture to state that such skill is only a portion of what is essential to make the business profitable. The human, personal element must be considered and that, it seems to me, is not sufficiently taken into account by the efficient engineers. We may find one company with all the efficiency systems known but, if it lacks the personal element, which is absolutely essential to success, the enterprise will fail. The manufacturing processes may be carried on with the greatest skill and efficiency, the labor cost may be the lowest and the product the best, but unless the raw materials are purchased on the right basis and at the right time and the product sold and distributed in the best possible manner, no business can be successful.

Furthermore, no business can succeed today without cooperation and loyalty in every branch. All must work for the common end and rise or fall together. That is the spirit of the times and the real secret of success. "Esprit de corps" or "team work" is essential. A happy, contented, loyal body of work people is necessary for success. The executive is responsible for that and to secure results must select, with great care, all his assistants, each especially fitted for a certain place, and then he must inspire them with his own energy, loyalty and enthusiasm and the same spirit must pass on down to the humblest employe. Without such an organization no modern business can succeed. In other words, it is the human, constructive, planning, guiding, and inspiring mind upon which, after all, success or failure depends and, it seems clear to me, that sort of ability or genius is "born, not made," and beyond the realms of "scientific efficiency management."

THE WAVE OF RADICALISM

We may well pause a moment to consider some phases of the way in which Radicalism has swept over the country, in fact, I may say over the world, for it does not seem limited to any country or any people. In our own country there has been so much talk and so much denunciation of the established order of things that one naturally begins to wonder if, after all, this nation and its form of government are failures. So much has been said about the "Rule of the People" that we are almost led to believe that our rights have been taken from us. It is claimed that we need new laws, new methods and a general overturning of old customs. It seems to me, however, that we do not need new laws nor more laws, we do not need new methods nor quicker methods of making laws, but that we do need a greater respect for the laws already existing and a firmer belief in law and order itself. Justice Story, one of our great jurists, said, "Ours is emphatically a government of laws, not of men." That doctrine was sound when he enunciated it, it is sound today, and it will be sound always.

THE TIMES

I am afraid that a certain failing in human nature makes one feel that "the times are out of joint," having in mind always by "the times" those in which one lives.

The following extract from a letter describing conditions in London, the high cost of living, extravagance of expenditure, and consequent discontent and labor upheavals, may interest you:

"An amazing luxury and dissipation, added to the vast wealth of individuals, and the extreme dearness and scarcity of many of the necessaries of life have, as it were, reduced the value of money, while custom (that tyrant to whom all must in some degree submit) has rendered it necessary for a man to spend a great deal of it, who would live with decency or make any tolerable appearance among his fellow mortals. And so rapid is the progress of luxury and the increase of the rate of living, that an American gentleman who was here five or six years ago, and returned again last fall, tells me he finds that the expense of living is at least one-third higher now than when he was here before.

"The seamen, the coal-heavers, the watermen, the journeyman hatters, sawyers, and weavers are up in large bodies, all complaining of the high price of provisions, etc., and demanding an increase of wages.

"On Wednesday, the seamen to the number of about eight thousand went down to Westminster with great regularity and without committing any outrages, presented a petition to Parliament, requesting an act for regulating their wages, etc. By this rising of the seamen the maritime trade of London has been totally stopped, and no ship permitted to go down the river for several days. Some concessions have been made to them and to the coal-heavers in respect to wages, in consequence of which some have gone to work again; but in general they are not satisfied."

The above has a very familiar tone, but it was not written in April, 1912. It was actually written in London in April, 1768, by William Samuel Johnson, one of the leading lawyers in the Colony of Connecticut. It seems from the above that extravagance, high cost of living and labor troubles were the common cry one hundred and fifty years

ago as they are today. The reformers of today, who have so many new cures for old troubles, would better study the history of other times, for they will find them not unlike our own. We may well exclaim as did the prophet of old: "There is no new thing under the sun!" I think also we may take new courage and new strength with which to carry on our tasks, with full confidence that they will be solved in due time, as the tasks of others have been in the past.

Congressman L. P. Padgett, of Columbia, Tenn., then spoke on the banking problems in cotton manufacture. An orator of unusual power, Congressman Padgett held the attention of his hearers while he impressed upon them the great importance of a sound banking system, not only for the manufacturers and merchants, but for the working people of the country.

The afternoon session on April 24 began with the reading by title of a paper on cotton growing in Egypt by Arno Schmidt, secretary of the International Cotton Federation. This paper, copies of which can be obtained from Secretary Woodbury, is taken largely from Secretary Schmidt's report of his recent visit to Egypt and which is given in another part of this issue. Papers were then read as follows:

ON THE BUYING OF LABOR

By JONATHAN THAYER LINCOLN, Fall River, Mass.

I have been asked to speak upon some live topic related to the manufacture of cotton cloth and I can think of no subject which at the present moment is more vital than that of labor. With this question, then, we shall occupy the present hour during which I shall attempt to present certain facts as I see them; trusting that whether you agree with me in my conclusions or not, you will believe in my desire to state them in a disinterested manner. I have chosen the subject partly because textile manufacturers have been grossly misrepresented not only by writers in the periodical press and in the newspapers, but especially, by social reformers, acting from the highest motives; and partly because we manufacturers as a class, piqued by public distrust, too frequently ignore all criticism, even that which we might turn to our own advantage as well as to the benefit of the community.

It is a singular fact that until quite recently employers have not studied very seriously the labor problem in its broader meaning. The question of wages, to be sure, has ever been a matter of immediate concern to all employers, but there has been a tendency to assume that the entire problem is one of wages, while in point of fact it includes every question at issue between employer and employe, whether it concerns wages, hours of labor, or factory conditions; moreover the labor problem is something other than an economic question—it appears, as well, in social and ethical aspects; indeed it is the fundamental problem of our modern democracy. Our first approach on the subject, however, must be from the economic side.

Labor is a commodity just as is cotton, coal, or any other commodity entering into the cost of production, but with this difference,—there is added to it the human element which makes the buying of it a far more difficult matter than the buying of any mere material commodity. To buy labor sorely with regard to wages would be quite as absurd as to buy cotton wholly with reference to the length of the staple,—there is, first of all, to be considered the obvious analogy between the quality of the raw material and the efficiency of labor and beyond this there are other and more complicated considerations. Manufacturers have

JONATHAN THAYER LINCOLN.

always recognized the value of judging cotton and they are coming more and more to realize that it is of even greater importance to understand labor, the other necessary commodity in the making of cotton goods. But, you say, we have always prided ourselves upon our knowledge of labor; no superintendent can hold his position in a factory unless he is able to handle help; and this is perfectly true, but the ability to handle help is only the beginning of a knowledge of labor, a fact which we are all coming more and more to recognize. I once knew a man who could thus handle help better than any other I have ever met, if by handling help is meant merely the strict enforcement of a rigid discipline, grounded in fear and resulting in hate. No toiler dared to approach this man with a grievance, to do so meant instant discharge; secretaries of labor unions who approached him were sent away with curt answers to their requests and more often they were not received at all, for his attitude toward unionism was consistently hostile. He held that the buying and selling of labor was purely a metter of individual bargain between the employer and the employe and the term "collective bargaining" had for him no meaning. He was a strong man of command-

ing personality and while he operated the factory these methods worked; but when he left the position to take up another work the whole system fell, and his successor reaped the harvest of discontent that he had sown. His successor learned through a trying experience that the labor problem is something more than the question of wages, that it is not only an economical problem, but a social problem, involving not merely the buyer and seller of a commodity, but the whole community; that it is not only a social problem but an ethical problem, involving the duties of the individual man to his fellowmen.

I have the deepest sympathy with all those good persons who believe that the present industrial order is far from perfect and who give their money to the work of making this world in which we live a better world, and I believe that they will not accuse me of prejudice if, speaking directly from the manufacturer's point of view, I refer to what seems to me an error into which they fall, that of placing too great a share of blame upon the manufacturer for the unequal social conditions which exist in our democracy. Labor legislation began with the factory acts of the British Parliament, wise acts for the protection of women and children employed in the cotton mill, and labor legislation ever since has been largely directed to regulation of manufacturing industries—those industries which create wealth. And the reformers pass by another large class of buyers of labor, those who take the materials which we produce and distribute them to the consumers. At times it has seemed to me that many of these well meaning persons believe it a crime that men should build great cotton factories, give employment to vast numbers of workingmen, and at the same time pay bank interest to their stockholders and occasionally a reasonable amount for the risk involved in manufacturing; while these same reformers hold in high esteem the retail merchants who sell the goods at ten or twenty times the manufacturers' profits, paying a rate of wages no higher than that paid to the operatives, but sometimes making a spectacular feature of welfare work.

The chief criticism which we have to meet from these reformers is that wages in our industry are, as they say, sub-normal, or, in other words, that cotton mill operatives do not rereice a living wage. This criticism is in some measure just—the average wage in the textile industry is lower than in many others; a skilled weaver receives less than a skilled mechanic, but it requires three years' apprenticeship to become an average machinist, while one can learn to weave in three weeks; yet comparing cotton manufacturing with other industries requiring no greater skill on the part of the operatives the criticism is without foundation. When the management of a retail store refuses to hire shop girls unless they live at home, because the rate of wages is too low to permit the individual worker to buy food, shelter and clothing, we call that industry sub-normal. The cotton industry, however, does not belong to this classification. I do not know how the operatives in other industrial centers feel, but I do know that in my own city of Fall River the working people themselves resent the sympathy extended by these reformers,—resent the imputation that cotton mill operatives are a race of paupers. In the factory, as in all other industries, wages depend to a marked degree upon individual efficiency. It is no uncommon thing in our textile towns for a family of operatives to receive a total annual income of $2,000; it is no uncommon thing for the families to own their home and put away tidy sums in the savings banks. But the reformers seldom mention these instances that are quite as characteristic as the discressing cases to which they point as a natural result of the family wage system.

Another illustration of the unjust attitude of sentimental social reformers towards the manufacturer may be found in the child labor agitation which a few years ago furnished the cheap magazines with such a wealth of sensational copy and placed the Southern cotton mills in such an unfavorable position in the public mind. About twenty years ago the cotton industry in the South commenced that remarkable development which transformed the states of North Carolina, South Carolina, and Georgia from agricultural to manufacturing communities. To the student familiar with the development of the cotton industry in Lancashire and in New England the employment of children in Southern mills must have appeared to be a natural consequence of industrial evolution. On the farms from which the operatives came to the manufacturing towns each child had his own work to do,—that the parents expected of them; and if on the farms children contributed to the family support the parents naturally asked, "why not in the factories." It was so in Lancashire in the early days of the factory system, it was so in Lowell when that industry was first introduced into New England. Those of you who have read "A New England Girlhood" will remember that when the mother of Lucy Larcom was unable to make both ends meet by conducting a factory boarding house it seemed natural enough that her daughter should seek work in the mill. Child labor in the South came as a natural result in the development of a new industry which transferred a multitude of workers from the fields to the factories; and the fault—if indeed it can so be called—was due to the insistence of the parents that they had a right to their children's labor and not primarily to the manufacturers, who, in many cases, gave employment to the young children only reluctantly and after the parents had insisted that all of their children should be employed or none. It was several years before the reformers became sufficiently familiar with the true situation to be willing to work with the employers in educating the parents to a more humane knowledge of their duty to their children. Instead the reformers antagonized the manufacturers by placing upon them the blame for a system which they desired to see speedily abolished.

It was only when the theoretical reformers and practical manufacturers joined forces that the evil was gradually rooted out, and its abolition was necessarily gradual because the system was the result of a natural law of industrial development. This instance illustrates how in a broader way the manufacturer and the social reformer instead of working in antagonism may join in a common cause for the improvement of social conditions.

(To be continued in June)

COST RECORDS

By CHARLES M. SEARS, 127 Kilsyth Road, Brookline, Mass.

Conditions just at this time make a consideration of cost records of peculiar interest. For the past year or two, most cotton mills have been tempted to diversify their product to almost a reckless extent, not only to catch the little business offered, but to be ready for such larger demands as the returning tide of prosperity should make. The tide has turned and the spindles and looms can go back to a more regular schedule. In determining what fabrics are the best in every way for the mill's future business, cost records that tell the truth, and all the truth, can be the manager's greatest friend.

There are other problems quite as vital within the mills themselves. The readjustment of wages, that has recently taken place, with a larger proportion of increase for day labor, will throw many cost formulas into confusion.

A very market increase in cost between the various lengths of staple cottons, brings up questions of fundamental and far-reaching significance, such as speed, twist, waste and new machinery.

Our friends the overseers, need to have their old rule-of-thumb methods reedited. The overseer is a vital element of manufacturing success, which is, at present, largely a compound of guess work, prejudice and timidity; by the way an excellent definition of "conservative." He must be trained to meet new conditions; have we facts, secured with scientific accuracy and simplicity, to concentrate the superintendent's and overseer's attention on the most vital points?

For the mastery of these problems it would seem an ideal worth trying for, to have at one's elbow an orderly and simple collection of facts,—facts that will give one a grasp of the possibilities and limitations of the mill organigation.

All mill problems will sift down to a question of how they affect the cost of production. My efforts for several years in manufacturing various kinds of cotton cloth, have been to develop some method that would tell me the truth about the cost of fabrics being run or what the new fabrics would cost. I have met others, working along that line, and through their generous help have now a fairly definite plan.

We will consider an average American cotton mill, equipped with looms and spinning. First the effort will be to determine the cost per pound of the various yarns and cost per yard of all subsequent processes. My basis for cost of yarn is the cost per spindle per day for general expense, carding and spinning.

The general expense cost includes the cost that is general for the entire plant, such as outside labor and supplies, power plant, office, salaries, insurance, interest, depreciation, etc. This may be divided into two parts, that directly under the mill manager and that controlled by the treasurer.

The carding cost is day labor and supplies, not frame hands who are paid by the hank.

The spinning cost is day labor and supplies and spinners, also if there is the same pay per spindle for all numbers of yarn spun.

These items for six months, divided by the number of spindles run and number of days run, will give a standard cost per spindle per day; then to determine the cost per pound of the various numbers of yarn for that much of the expense, divide by the various pounds per day per spindle.

To illustrate, take the carding for a 100,000 spindle mill, 150 days' run:

	Total Cost.	Per spindle per day.
Labor	$10,000	.06667 cents.
Supplies	5.000	.03333
Total	$15,000	.10000 cents.

CHARLES M. SEARS.

If 35s was one of the yarns spun and the production per spindle per day was .19 pounds, the cost per pound in the card room would be:

	Cents.			Cents.
Labor	.06667	÷ .19	=	.351
Supplies	.03333	÷ .19	=	.175
Total	.10000	÷ .19	=	.526

This principle lends itself readily to a very graphic and flexible system of records that will vary, of course, to suit the needs of any mill. The reason for diverting so much of the cost by the spindle, is to place the proper burden of cost on the finer yarns. The average mill does not have a very wide range of numbers, but if there is a wide range, the character of the machinery and methods used, will divide the preparation into distinct units, which should be handled as separate plants. To further illustrate, suppose there are a certain number of spindles each on 28s and 35s yarns, and a change is made, putting half the 28s spindles onto 40s. The total product would be lessened at once and the total cost per pound for general expense, carding and spinning increased, while the

actual payroll cost per spindle remained the same. All this increase will by the spindle method go where it belongs, as the cost per pound of each number is determined by the product per spindle. The cost of 28s and 35s would remain as before, while the increase in the cost would all go to the 40s. In estimating what the cost of 40s would have been before the change was made, it would be merely necessary to determine what the product per spindle would be under your own peculiar conditions.

In assembling the total cost per pound of the yarns, there is yet to consider the frame cost in the card room, which can be determined through the price paid per hank. The cost of spinners can be adjusted, if necessary, with reference to the variations due to local conditions.

ferent cost stocks, the percentage of each yarn in the cloth must be figured from that figure the cotton cost in a pound of cloth; dividing by the yards per pound of the fabric will give the cost per yard. The per cent. of waste is apt to be rather carelessly applied. For instance, in many mills the high priced stock from which the best yarns are made, does not receive any roving or spinning wastes, so that quite a quantity of high price cotton goes into the lower grades. This loss should be charged to the high grade yarns making the percentage of waste much higher than the average per cent. on the high grade and lower for the low grade yarns.

The total cost of any fabric run during the six months can now be determined. The cost per pound of the yarns being known, the cost per

.....191.....

SAMPLE NO.....

Manufacturing Cost;

	Warp	Warp
Production, Hank		
Pounds		
Indirect Expense		
Carding, Day and Supplies		
Combing		
Slubbers		
Intermadiates		
Fine Frames		
Jack Frames		
Spinning, Day and Supplies		
Job		
Spooling		
Warping		
Yarn, cost per pound		
Yarn in Cloth per yd.		
Slashing, "		
Drawing-in, "		
Weaving, Job "		
Fixers, "		
Day "		
Supplies, "		
Cloth Room, "		
Labor and General Expense per yard		

Style;

Order of		
Width	Weight	
Count		
Warp		per cent.
Filling		"
No. of Harness		
Loom	Speed	
Yards per loom per day		per cent. run
Weaving price	per cut	yds.
Price of Cotton; Warp	Filling	
Cotton in Cloth per yd.		
Labor and Gen. Ex. per yd.		
Total Cost per yd.		

Under this plan, as perhaps it would under any other, it is best pay the spooling at so much per 100 spinning spindles, varying the price for each number, so that the cost per spindle can be at once figured, and from that the cost per pound.

An interesting method of determining the cost of warping is to divide the total cost among the various numbers in proportion to the total number of hanks spun of each number, and then dividing those sums by the pounds run of each number, giving the cost per pound.

With the above figures assembled on a proper card, the cost per pound of the yarns made for six months can be shown.

Under usual conditions the cost per yard in the slasher and cloth rooms is practically constant for all styles run. Drawing-in costs per yard are found by knowing the number of cuts on the loom beams, price and average yards per cut woven. In the weave room the weaver's cost per yard is determined directly by the cost per cut. The fixers, day hands and supplies can be figured down to so much per loom and this being divided by the product per loom of each fabric, the cost per yard is found.

The cost of cotton per yard is determined in this way,—if the warp and filling are made of different cost stocks, the percentage of each yarn in the cloth must be figured from that figure the cotton cost in a pound of cloth; dividing by the yards per pound of the fabric will give the cost per yard. The per cent. of waste is apt to be rather carelessly applied. For instance, in many mills the high priced stock from which the best yarns are made, does not receive any roving or spinning wastes, so that quite a quantity of high price cotton goes into the lower grades. This loss should be charged to the high grade yarns making the percentage of waste much higher than the average per cent. on the high grade and lower for the low grade yarns.

The total cost of any fabric run during the six months can now be determined. The cost per pound of the yarns being known, the cost per yard of the yarns in any cloth can be found in the same way as shown for the cotton in the cloth.

As a summary, a form is given which I have found convenient for figuring the cost of any new fabric. Upon this sheet can be assembled all the figures necessary and makes a good record for reference.

In its practical application this form is spread out to a height of about six inches, is printed upon a sheet 9 by 12 inches, ruled horizontally with six lines to the inch, and vertically three-eighths of an inch apart, the lower part of the page reserved blank for figuring. These separate sheets are punched so as to be held in a binder.

This method demands very accurate production statements from the spinning room. The warp is easily derived from the warper beams, but if there is ring filling, more difficulty is encountered. One method is to count the doffs of each yarn made with occasional, but regular, tests as to the weight of yarn in each doff; a check on this method can be made by some system of receipt in the weave room. Clocks can be used on the front rolls of the frame, as another method, with occasional but regular tests for the allowance to be made for ends down. I prefer this of the two methods for it opens up an interesting field for testing and ex-

perimenting. The spinning room is one fine station to determine the "reason why" with a considerable degree of accuracy; a few clocks on the warp frames is a good idea. Either method, however, is open to error and the human inclination to exaggerate (by "human" I mean the overseer), so a further check should be made in the office through analyzing the cloth product. The cloth product is accurate in weight and yards, but to allow for the increase or decrease of yarns in stock, careful "stock-in-process" reports should be made. The per cent. of sizing in the cloth is another important item and for many reasons accurate tests should be regularly made.

Having these items: cloth products, stock-in-process at beginning and end of term, percentage in sizing in cloth, and per cents. of warp and filling in each fabric, a very accurate proof of the yarn can be made.

I have made references to "occasional but regular" tests and reports. Many mills make occasional tests of one kind or another and base long years of effort upon them without repetition and prejudice not real facts is the result. I advocate a system of occasional and regular tests with careful and graphic records, organized to suit the local conditions and adhered to strictly. For instance, to analyze the waste in the various processes, the results of new machinery or methods, the actual reasons why ends come down in the spinning and the per cent. due to each reason, the same in the weave room why the looms stop, why the machine shop is so busy, and the per cent. of moisture in starch and cotton. A cotton mill can be made a most inspiring and profitable adventure, or left to hum sleepily along. This scientific effort for truth and simplicity seems to me to be a characteristically American one and will prove, perhaps, the solution of many stringent conditions.

A system composed only of ideas and carefully ruled sheets of paper will not long run itself; in some of the larger corporations today such matters are placed in the hands of a regular man who gives it his entire attention and very wisely to. If he is a trained mill man, there is an unlimited field for usefulness, as truthful information is dependent upon a clear mind, free from interruption, prejudice, ignorance or selfish thoughts of "holding the job," that is apt to affect the regular officials and hands in the mill. The smaller mills need the same attendance either through a regular employe or the occasional visit of an expert on the same principle that their books are regularly audited. Our financial records have developed from the old "memory and slate" system to the highly accurate and scientific simplicity of modern accounting; cotton and labor are money just as much as cheques and bank deposits and will profit by a similar approach.

Georgia, Lafayette. The management of the Lafayette Cotton Mills expects to increase the equipment to a large extent during the year.

Georgia, Villa Rica. The Villa Rica Cotton Oil Co., which is operating 2,400 spindles on cotton yarns, proposes to double this equipment during the year. 8s to 16s yarns for weaving are manufactured. W. B. Candler is president and G. P. Braswell, general manager

THE INTERPRETATION OF WATER RIGHTS IN CONNECTION WITH WATER POWER

By RICHARD A. HALE, Consulting Engineer, Asst. Engineer, Essex Co., Lawrence, Mass.

The title of this paper is suggestive of a legal discussion of the subject, which, however, is not intended strictly from that point of view. It will deal, however, with questions of rights which have required the assistance of engineers in connection with the courts to decide what is considered equity in various water right cases and may be of interest to all owners of water power.

The deeds, leases, etc., conveying water powers to companies or individuals are drawn with various degrees of accuracy, and questions are frequently arising as to their meaning and the practical application of the intention of such deeds. The large water companies, such as those located at Lowell, Lawrence, Manchester, Holyoke, Turner's Falls and Bellows' Falls, have a form of leases and deeds defining clearly what is conveyed. To illustrate, as an example, the Essex Company of Lawrence, controlling the water power of the Merrimack river at Lawrence, leases the water in "mill powers." A mill power is the right to draw from the nearest canal or water course so much water as shall give a power equal to 30 cubic feet of water per second when the head and fall is 25 feet, to be drawn 16 hours a day. As the height of water varies with change of seasons, the quantity of water is varied in proportion to the height, one foot being deducted from the height of the fall and also from that with which it is compared before computing the proportion between them; thus for any fall the quantity of water to make a mill power is:

$(750 - 30) \div (\text{Fall} - 1)$.

The one foot is allowed for the loss of head in reaching and leaving the wheels. This definition of a mill power giving a constant power is ex-

RICHARD A. HALE.

plicit, and during the 61 years in which it has been in use, has admitted of but one interpretation, and has never been questioned. In terms of a horse power, a mill power represents about 85 gross horse power, and if a wheel has an efficiency of 80 per cent., about 68 horse power will be obtained on the main shaft. As the quantity of water increases with the decrease in fall, and decreases with the increase in fall, it will be apparent that a constant power is assumed by the leases. The lease at Lowell, Holyoke, Turner's Falls and Bellows' Falls, are written on the same general plan with the exception that in one locality the quantity of water is leased in cubic feet per minute drawn for 16 hours each day under an average head, without provision being made in all cases for changes in the quantity of water drawn, due to variations in the head. In this instance the power would constantly vary with the changes of the head of water from canal to river.

If all leases were as definite as these mentioned, there would be practically no occasion for questioning the rights of the parties. But, unfortunately, many conveyances and deeds made in the early period relating to water powers, contain descriptions of water power conveyed which are not expressed in definite terms of units such as cubic feet per second. With several owners located on the same dam, the deeds sometime express the fractional proportion of the river to which each is entitled. Other deeds may express the amount of water conveyed by penstock of fixed dimensions. Some deeds define the rights as sufficient water for so many run of stone with reference to the old grist mills custom and which are being replaced by modern methods of steel roller mills.

A large proportion of old deeds describe the rights in square inches of water and orifices which are susceptible of varying interpretations.

The rights of running 10 hours and 24 hours on various mills on the same stream is a vexed question in which appeal to the courts is made and the joint control of stream reservoirs with different interests involved bring up points for discussion as to their use for the best interest of all. Some illustrations of actual examples may be of interest as showing the practical methods of dealing with them, and they will be considered in various groups. Some examples of the use of square inches are as follows:

The Cohoes Company granted water rights as a mill power which was defined as a quantity of water which with the whole head and fall between surface levels, shall give a water power equivalent to the power given by the water which will flow through an aperture 50 inches long horizontally and two inches wide vertically, made in a metal plate at least one inch thick, with a head three feet above and a fall 17 feet below the middle line of such aperture. Other grants were on the basis of longer or shorter length proportionally with the same head and fall. Provision is made that the quantity of water should be increased as the head is diminished so as at all times to give the power mentioned in the deed.

James B. Francis, C. E., of Lowell, made careful experiments on an orifice 50 by 2 inches in a cast iron plate one inch thick with sharp edges under a head of three feet with free discharge, and found a quantity of 5.9 cubic feet per second passing, and a co-efficient of discharge of .611 of the theoretical quantity.

Later proposals fixed a mill power at six cubic feet per second on a fall of 20 feet, with an increase or decrease in the quantity as the fall varies.

A recent case, which involves various water rights in Hinsdale, N. H., may be of interest as being applicable in many places. A company was formed in 1839 in Hinsdale for the purpose of building a dam, canal, etc., and developing power for manufacturing purposes. Eight persons were interested in the scheme and owned the power in certain proportions measured by square inches. Various questions arising in regard to the quantities of water, in 1859 bulkheads of plank were placed at the entrances to their flumes, and orifices having the areas of their legal number of square inches were made in the bulkheads, at the proper distance below the surface of the water in the canal, by a legal degree of the court. The number of inches and head were very definitely stated, but thickness of the orifice plate was not mentioned. One party was entitled to the surplus in the river after all others had been supplied with their legal rights. In 1867 it was agreed by the manufacturers that the canal should be enlarged to carry an increased quantity of water, and to improve the general conditions of water power, and $1,500 was expended in this manner. It was also agreed that whatever increase was obtained should be divided pro rata, according to the number of square inches owned by each party. At about this date the upper portions of bulkheads were removed and water was drawn over the top with no reference to orifices, and the amount of water drawn was limited by the capacity of the water wheels. In the year 1885 suit was brought, by parties owning the right of surplus, to compel the restoration of the upper portions of bulkheads, but nothing definite was accomplished. In 1905 owing to changes made by parties owning surplus, a suit was brought against them by the remaining owners on the grounds of excessive use of water. The rights of all parties were to be determined. The writer had made some investigations for the parties entitled to the surplus, and the late Freeman C. Coffin was engaged by the other parties to the suit. As there were many hydraulic problems involved and engineering facts that it seemed unnecessary to work up in duplicate, which would have to be ascertained in a suit in court, the writer suggested that the engineers should consult together and make a joint report. This was agreed upon by all parties, and the court appointed Freeman C. Coffin and the writer as engineering members, and Hon. J. H. Frink, counselor-at-law of Portsmouth, N. H., as the legal member of the commission. The commission were to hold meetings and make a report to the court as to the amount and the methods of drawing the water to which each was entitled. Several hearings were held, and with the writer as chairman, testimony was given in regard to the enlargements of canals and past use of water, and a report was made giving the amounts of water to which each was entitled under varying conditions

of flow. The main problem was to determine the surplus previous to 1867, and what additional surplus was gained by enlarging the canal at that time, which was to be divided among the owners. All additional surplus belonged to the eighth party. The questions of the yield of the stream and the capacity of the canal were considered and the fact that the parties had used the water for a long period (about twenty years), without remonstrance, was given weight. A system of measuring weirs was recommended and adopted by which each party should draw the amount to which it was entitled. As the parties were not entitled to quantities of water on an equal basis, but certain ones had priority over others, it was necessary to adapt the lengths and heights of the weirs to fit these conditions as far as possible. Various adjustments were made after the weirs were placed in position. Another difficulty arose from the fact that the surface slope in the canal varied with varying quantities of water, necessitating heights of weir crests which were correct for one quantity and not strictly accurate for another. By experimenting with varying lengths and heights of weir, the quantity which each was entitled to draw was decided with a fair degree of approximation. For very small flows tables of heights were given, showing when parties should cease drawing in order of decreed rights. Two of the rights have been combined, making one party less in the final division. In the later years no special efforts were made to maintain the rights of each owner, which if maintained in a systematic manner, would have avoided the extensive investigation and adjustment. An objection to the use of measuring weirs occurs in the fact that they reduce the available head on the wheel. One other plan was proposed, that of attaching gages to the wheels and from the fall and openings regulating the quantities. This would require much more detail and the owners preferred to lose the head during the lower period of flow and have an automatic measurement rather than to require so much detail by the other method. During the period when water was abundant there was practically no head lost.

The plan of measuring weirs reported by the commission was approved by the court and a decree issued ordering their construction. They are in practical operation to the satisfaction of all parties. The fact that some of the original orifices were in existence and the form in which they were made assisted materially in the final conclusions. As a matter of fact, the water in the canal was carried at a greater height than formerly and the upper planks of the bulkhead were removed at the penstocks of all the mills so that quantity drawn was limited only by the capacity of the wheels. This method of adopting weirs prevented the general use of unlimited quantities.

Another instance in the same town was a paper mill and wooden mill both situated on the same dam. The woolen mill was entitled to about two-thirds of the flow and the paper company to one-third of the flow of the stream. The woolen mill was entitled in addition to a small additional amount defined as the first twentieth drawn for wash-water as a prior right. The usual method has been to arrange two head gates for the woolen mill and one head gate for the paper mill, making them similar in dimension. But this resulted in the amount of water drawn being controlled by the water wheels, as different velocities could exist through the head gate openings and the subdivision was inaccurate. The final arrangement was to build two weirs of proportional lengths in the flumes with the crests at the same levels that would divide water proportionally. An opening about 12 inches square was placed near the bottom of the flume through the weir plank to provide for the prior right to wash-water. This was not absolutely correct, but it was an approximation that served the purpose in a practical manner. A mtehod of observing the opening of the wheel gates with the head and fall was considered, and by using the wheels as water meters divide the quantity proportionally. This necessarily would make much detail, and the method of weirs was preferred at the expense of loss of head. The situation was somewhat complicated by the woolen mill running ten hours per day and wishing to store water for the remaining fourteen hours, while the paper mill wished to run the engine twenty-four hours. As the pond above dam was small in area and there were many paper mills on dams above further upstream, the storage during the fourteen hours would have been difficult to control and the effects of this storage was considered as being very slight and the stream should be divided according to the natural flow as it came to the dam from the mills above.

Another example of the definition of a square inch as in the water power deed at Rock River, Janesville, Wis., was defined by the counts some years ago. At this locality is an extensive water power with an estimated capacity of 20,000 square inches in the ordinary flow of the river. This was divided among twenty different owners who pay in proportion to the amount of power which they require. In 1874, questions have arisen in regard to the amounts of water and power used by various parties, the following facts were established as to the interpretations of leases.

The form of lease relating to the granting of the power was as follows: One example is taken for illustration. "The perpetual use of 209 inches of water to be drawn under a head of four feet, or water under any other greater head to produce a power equal to the power produced by the aforesaid number inches drawn under the aforesaid head." The definition of a square inch of water as stated in the case was as follows: A square inch of water under a given head is the quantity of water that under the given head will flow in a stream having a section of one inch square, the discharge being made freely into the air, the head measured above the center of the orifice and section of the stream measured where it is the smallest. This definition would consider the co-efficient of discharge as unity. The actual quantity would then be the number of square inches multiplied by the velocity due the head under which the quantity is drawn; 1,000 square inches under a head of four feet would be 111.4 cubic feet per second.

Among the early deeds we often find the water rights conveyed as being so many run of stone in connection with grist mill rights which have always existed on the streams of small water powers in the country as also the larger mills of New

York state and farther west. It has been found necessary to make investigations at various times to determine what the term "run of stone" meant in the equivalent amount of water in cubic feet per second or net horse power. Experiments have been made at various localities, but the most important investigations were made at Ogdensburg, N. Y., in 1872, when the Supreme Court in its decree stated the method of setting bolts for establishing falls, measuring weirs, etc., and stated in Article 28 of the decree, the following which has a special bearing on the run of stone as follows:

"That the quantity of water which constitutes a run of water, under the provisions of said Exhibits Nos. 6, 7, 8, 9, 10, 11 and 12, being such quantity as was sufficient with the most approved wheels and water-saving machinery, to propel a run of stone with the necessary bolts and machinery of a flouring mill, at the time said conveyances were executed, in twenty-five cubic feet per second when the fall is nine feet, or water enough to produce an equivalent power when the fall is more or less, to wit:

32 cubic feet per second, when the fall is 7 feet.
28 cubic feet per second, when the fall is 8 feet.
22.5 cubic feet per second, when the fall is 10 feet.
20.5 cubic feet per second, when the fall is 11 feet.

the said quantity being nearly equal to twenty-five horse power, and such quantity is the amount hereinafter specified as the standard quantity for a run."

The method of grinding by the steel roller mills of the present day has created an entirely different situation from the past when the grist mills on the country streams were in use.

With electrical developments both for power and lighting, the use of water twenty-four hours often conflicts with the usual ten hours' use of textile industries. The textile mills using the water for ten hours, plan to retain the flow for fourteen hours for use during the following day. This naturally conflicts with a company who wishes to run for street lighting or similar purposes in the evening. This has been the cause of contention in courts and recent case of Mason vs. Baxter D. Whitney at Winchendon, Mass., regarding the use of water for electric lighting at night when other mills on the stream wished to conserve the water for use during ten hours, was before the Supreme Court. Many questions were discussed regarding storage, surplus water, the natural flow of the stream and the reasonable use of the water in connection with the greatest use to all. The final decision placed some restrictions on the use of water at night, depending on a definite amount of water being supplied on the following day.

The control of storage reservoirs near the head waters of a stream by mills situated some distance farther down the stream and with other mill privileges intervening may raise the question as to what extent the reservoir may be used without affecting the riparian rights of the intermediate owners. An illustration of this use is Lake Winnipissiogee in New Hampshire, for many years held as a storage reservoir by the Essex Company, Lawrence, and the Locks and Canals Company of Lowell. Some antagonism was indicated in New Hampshire at times by the control of this reservoir of companies outside of the state, but it was shown conclusively that the water was used at dry periods when it was of benefit to every mill on the stream throughout the state of New Hampshire, and was a benefit rather than a detriment.

The first paper read at the session on Thursday forenoon was on the

EQUIPMENT AND TESTING FOR UNIFORM SIZING

By LEONARD W. CRONKHITE, 83 State St., Boston, Mass.

A large and carefully managed cotton mill investigated the supposedly uniform work of its sizing department. On goods of the same specifications, the percentage of size added to the yarn was found to range from 6 to 11 per cent. In another

LEONARD W. CRONKHITE.

mill where similar work running in two slasher rooms was tested for weight it was found that one room was putting on 7 per cent. and the other 12 per cent. of size. Two slasher machines side by side, using size from the same kettle and sizing the same sort of warps for identically the same weaves have been known to be from 3 to 5 per cent. apart in respect of the amount of size added. Variations from hour to hour on the same slasher have been noted; and it is common mill experience that the first run in the morning is liable to give light warps, and the first run in the afternoon to give either light or extra heavy sized warps according to the custom followed during the noon stop.

Since relatively few mills calculate size records from hour to hour and day to day, perhaps few realize what lack of uniformity attends the sizing process. No manufacturer is safe in saying that his sizing is done uniformly until he has made careful tests, and attempted certain precautions that at best the average equipment may make almost of no use. In fact under the conditions imposed by the incompleteness of the average sizing equipment, uniformly good warps are well nigh a

miracle. German mills, in particular, and some mills here, are proceeding on the assumption that the trouble lies largely in the equipment rather than in the vigilance of the size room operatives, and have modified the fittings and practice of their size departments accordingly.

The suggestions following are intended to enable checking up the work of a sizing department by certain standards absolutely essential to uniform work.

EQUIPMENT FOR UNIFORM WORK

In some mills the kettle room is like a clean kitchen, in others it is a place where apparently anything will do in any way. Cooking size uniformly is so far from being a crude task that the equipment should be so good as to be an incentive to the operatives towards cleanliness and attention to details. Considering how easily the consistency of starch either in its manufacture or in its use is affected by slight chemical disturbances, the degree of cleanliness usually exercised in the kettle room is insufficient. Any size left in the kettles to harden and cause rust or corrosion is some day going to cause change in a mixing. Kettles and agitators need frequent scraping, flushing, and cleansing to insure uniform results in the first stage of the sizing process. If the kettle room is arranged properly, there will be little temptation to accumulate size sweepings, dirt, and hardened size, to dump into the boiling mixings to lower the quality of the size. Good starch bins are a small but paying investment. The best bins are those built overhead, at the bottom of which the starch is easily on tap. Metal pans or flooring at the base of the kettles take care of overflows and are easily cleaned.

DISSOLVING BECKS

Some mills use tubs in which to stir the dry starch into water in order that it may be strained through a sieve on its way into the boiling kettle. The condition of some starches make this a wise precaution. The breakage on the slasher due to the presence of chips, insoluble lumps, and other foreign matter has in some cases been found to be considerable.

COOKING APPLIANCES

The size kettle is worthy of more careful study. Some idea of the attention given it by foreign, especially German manufacturers, can be had from but a glance at the foreign literature on the subject.

The kettle ought, of course, to be made of noncorrosive metal. The occurrence of runs of rust spots and stains, due in part to improper cleaning, is generally to be laid to the character of the kettle or its fittings. The chemical action of caked and putrifying size on a susceptible metal is rapid, thins the size, and causes staining. Iron kettles are a costly economy. Tinned or galvanized iron is better, but copper is better yet.

The use of wood for kettles is as a rule to be condemned. The shape of the wood vat is usually wrong, the corners of wooden vats making proper agitation impossible, and inviting the caking of size. Unless wood vats are frequently renewed, the wood becomes impregnated with spoiled size that exerts an acid and thinning action on the mixings. Wooden vats are seldom constructed to close tight at the top and this adds further to make them undesirable.

A kettle ought to be fitted with tight covers. Often mill operatives are found boiling one kettle with the cover up and another kettle with the cover down. The difference in thinning of the mixings from condensation or evaporation is a factor. The rough and ready method of testing size in the kettle by letting some of the mixture run off the end of a stirring paddle does not show up variations in viscosity from such causes, but they nevertheless affect the weaving quality of a warp. In a large industrial laundry where the slightest change in the consistency of the starch is at once reflected in the work, difference in the starch mixture was once traced to so slight a thing as the manipulation of the covers of the starch kettles. In one or two instances chemical disturbances from atmospheric conditions due to the proximity of nearby chemical work have made closed kettles absolutely necessary. Some foreign manufacturers have seen further reasons for tightly closed kettles and utilize the construction to enable agitation of the mixture by strong steam jets instead of mechanical agitators, and to allow violent boiling of sizing substances not readily dissolvable in the usual way.

Any kettle ought to be fitted with agitators that agitate. The usual two-paddle one-way agitator is defective. It generally resolves the size instead of thoroughly mixing it. Relatively few mills can stir the mixture into a perfect starch milk before they boil the size. The result is that the starch paste is not absolutely homogeneous and free from little globules of partly cooked starch that later appear at the squeeze rolls. Sets of agitator arms moving in opposite directions give a mixture of uniform consistency, break up the lumps, bring every part of the mixture into contact with the maximum heat, and lessen the accumulation of cakes of size on any part of the kettle or agitator arms. Apparatus of this kind moreover brings within the range of use many substances not easily dissolved but useful in sizing.

The method of heating the mixture in the kettle is important and intimately affects the uniformity of the results. Small jacketed kettles considerably used in foreign plants constitute the only proper arrangement, certainly for small plants. The jacketed kettle does away with the disturbing factor of condensation. In some mills, getting dry steam seems to be a problem; thinning of the mixture as much as 15 per cent. has been observed. Many size rooms are under a constant handicap in this respect. If steam is injected directly into the mixture every possible precaution ought to be taken to deliver dry steam. Where the location of the size rooms makes dry steam difficult to get jacketed kettles only ought to be used.

It goes without saying that every mill needs kettles enough to be able if necessary to boil up different mixings for different goods. Yet many mills for lack of an extra kettle or two are seriously limiting the proper special treatment of thousands of pounds of cotton in the relatively inexpensive sizing process preparatory to the ex-

pensive process of weaving. In some cases resort is had to either adding water to the size in the boxes or stirring in cold starch to get the right consistency for a special run of work on one of two or more slashers. It is impossible to do uniform work in this way. Even in a small mill where more than one kettle may seem necessary, resort to this rule of thumb method ought to be avoided by having an extra kettle.

PIPING

A similar limitation on special treatment of different warps often exists because of incomplete piping from the various kettles to the various slashers. Many mills have plenty of kettles, plenty of slashers, and varied styles of work, but never have brought these elements into harmonious relation. It means only a small outlay on extra piping and valves, to connect every kettle with every slasher, so that any kind of mixing desired can be run on the special work of any slasher. The piping ought to be of copper or brass and of ample size. Any kind of iron piping means a run of spots at some time or other. There should be no sharp angles to hinder the flow of size and strain the pumps; all changes of direction should be in wide curves. The branch pipes leading from the main piping system to each slasher should be as large and short as possible, and readily detachable for special cleaning. If the main piping is dipped in a wide curve beside each size box, the length of these branch tap pipes can be reduced to a minimum to avoid all refuges outside the circulation system for the size to cool and harden in.

PUMPING AND CIRCULATION SYSTEM

It is practically impossible to size uniformly with a gravity system of conveyance from kettles to size boxes. In any gravity system the size has time to cool and gelatinize in some section of piping. If this cold size sticks and has to be blown out by steam, the result is a run of thinned size. Before the jelly lumps that blow out can be boiled up, they are likely to form hard spots on the yarn. A strong pumping system avoids some of these troubles.

No pumping system, however, is complete unless the piping admits of constant circulation of the size from the kettles through the pipes past each slasher tap, and back again to the kettles. This is absolutely essential to uniform work. The size is at all stages hot and is delivered at a uniform viscosity. If the long curve dip before mentioned is given to the main pipes beside each size box, all possibility of disturbance from cold size in the short branch tap pipes can be avoided.

A refinement found in a few mills is an arrangement of the piping by which all size left in the size boxes at noon and night can be pumped back to the kettles, leaving the boxes empty to be flushed and cleaned.

Many mills having no such arrangement leave size in the boxes overnight. It would be a saving in weaving expense to throw this size away rather than leave it. The skin that forms in contact with the air is almost impossible of solution again, the water used to flush and soften the rolls thins the mixture, the steam jets become clogged, and the mixture itself cooked a second time is never quite right again. Some mills cannot even throw the size away without having the operatives carry it off to some sink pail by pail. The result is that the boxes are seldom emptied and seldom cleaned. One large mill runs with an accumulation of one inch of plain black mud on the bottom of each size box for just such a reason as this. The least that can be done is to have direct sewer connection with each box. With a complete circulation and pumping system recourse to these wasteful and damaging practices can easily be avoided. Moreover the whole piping system, the boxes, and the kettles can be flushed with hot water and steam, and cleaning made part of the regular operation of the sizing plant.

In one or two cases where the proper system of return from each box is used, the size in the boxes at night is pumped back to a kettle in which there has previously been boiled up a mixing heavier than the usual batch. Mixing the return size that has been thinned in the boxes by condensation, with the thicker batch about evens up the thickness to the usual standard for the first run in the morning. This practice is an improvement, but even it is not strictly good, since the composite mixture described does not give the usual addition of weight. There being somewhat more solid matter than usual to each gallon to give the required thickness in the morning, the weight added to the yarn will be a litttle off standard. The perfect way is to gauge the size needed for each day and make fresh batches every morning. Size that is boiled up a second time is not as efficient as size that is applied direct from the first cooking. Reboiling impairs adhesiveness, a fact that doubtless explains the feeling of some operatives that letting size stand over night makes it smoother in feel in the morning. Where size must be left over night, mixing it with a freshly prepared and heavier mixing in the morning is the best expedient.

In mills having a long line of slashers and having no circulation system, difficulty is sometimes experienced on the distant slashers in getting the size as thick and strong as on the nearer slashers. In a gravity system this is due to the accumulation of separated water in the end pipes, and to the fact that the cooled size in the distant sections of piping has to be boiled up again in the boxes and is thereby impaired in adhesiveness, feeling on the yarn as if it were thin and weak.

One way to rectify this is to have a kettle of extra heavy size in the regular kettle room, conveying this if necessary in pails, but preferably in an extra large pipe to a mixing beck near the further slash. Into this beck is run a definite proportion of the regular size and a definite proportion of the heavier size, the mixture being fed to the slashers at the right consistency. A good circulation system through large pipes will of itself obviate trouble of this character in nearly all cases.

SIZE BOX ATTACHMENTS

The ordinary size box is an added source of difficulty in getting uniform work.

The box of course should be of non-rusting material. Occasionally a case comes to light where the box and all the fittings are of brass or copper

save perhaps one little elbow, and to the action of hardened size on that one spot has been traced runs of rust spots.

The use of steam jets in the size box is a source of trouble. The steam thins the size. The steam pipes get clogged. The boiling is often too violent, and causes hard spots when the size strikes the yarn after it has passed the squeeze rolls. The extreme heat further cakes any size already cooled in the corners of the box. The size is not easily kept at a uniform heat.

The best remedy for these difficulties is the cornerless double bottomed box, the upper or size box of which is heated by hot water in the lower compartment. This scheme is in considerable use in foreign mills.

VIEW IN EXHIBITION, AMERICAN TOOL & MACHINE CO.

No more important factor for or against uniform sizing operates than the height of the size in the box relative to the squeeze rolls. Regulation of this is generally left to the vigilance of the slasher tender, but should be automatic. Some mills use electrical bell signals to call attention to the need for more size. A surer way is the automatic float feed. This keeps the size at a constant level and at a practically constant heat. In mills where there are no such devices, as the size gets low in the box it is the custom of some operatives to keep lowering the depression roller instead of constantly running in more size. But it is not merely the depth of the depression roll in the size that determines the amount of size added to the yarn, but also the dip of the squeeze rolls into the size, since this determines the amount of size taken up by the lower rolls to the point where the upper and lower squeeze rolls meet the yarn, where they impregnate it with size as well as squeeze the surplus size off.

It seems evident enough that the weight and condition of the squeeze rolls can greatly influence the amount of size taken up by the yarn, and to some extent the way in which the size will be distributed through the yarn. A large mill was once attempting to size similar yarns for the same work with similar mixings on similar machines, and yet use rolls weighing 400 pounds more on one machine than on the other, without compensating leverage devices of any kind. The actual difference in amount of size added ran over 4 per cent. Too careful attention to the condition and lapping of the cloth on the rolls cannot be given, streaks and badly sized spots readily being caused by poor rolls.

On one or two new foreign types of slasher machine, careful attention to all such details at the size box, and also to breaks and laps on the back beams is made easy for the operatives by arrangement of the machinery in such a way that the weaver's beam of sized yarn is located near the size box just ahead of the back beams, the whole

operation being under the operative's eye from one point.

SLASHER MACHINE FACTORS

The usual cylinder drying slasher has defects that have led to the adoption in Germany, France, and to some extent in England, of improved forms of air drying apparatus, utilizing modern principles of forced ventilation. As these improvements do not in all points affect the question of uniform work, they ought not to be described at length here; but a serious study of their claims to betterment of the work is worthy any manufacturer's time and impartial literature on the subject can readily be obtained. Briefly the new systems, in addition to giving greater production, dry the yarn progressively, reduce the tension to a minimum, retain the original roundness of the thread, largely do away with baking the ends together and the consequent injury to the warp in separating the ends, automatically cool the drying chambers during stoppages or slow speed to avoid hard-sized runs, and better the room conditions. In addition some of the new machines are fitted with either rotary or reciprocating brushes to better lay the fiber before the yarn is dried, and to cause easier separation after it is dried with less tearing up of the fiber at the lease rods.

The substitution of air for cylinder drying involves an important factor affecting uniform work, that is extremely difficult to regulate on cylinder dryers. Stoppages or slow runs generally mean hard and streaky sized places, entailing extra damage to the threads when they are pulled apart at the lease rods, extra difficulty in the loom, and an uneven feel to the goods. The use of automatic appliances to reduce the steam heat in the cylinders is a help, but even then the heat retained by the metal surfaces of the cylinders tends to bake the yarn, cause hard runs and extra damage at the lease rods when the sheet is separated. In the new drying machines quick cooling of the drying chambers during stoppages is easily effected.

When a slasner is used for sizing and drying a number of different styles in turn, care is not always taken to regulate the heat so that a light sheet will be delivered on the weaver's beam with as much of the necessary moisture in the starch and the cotton as would be retained in a heavy sheet. A reduction of say 20 per cent. in steam pressure will not mean a reduction in degrees of temperature in anywhere near as great a proportion, and allowance for greater reduction in steam pressure made.

An apparently minor cause can greatly vary the quality, especially of close weaves, and that is the rolling and crossing of ends as they wind on to the weaver's beam. A simple patent device worthy of notice consists of a straight comb and another off-set comb, the teeth of which are inclined; the bent comb forces the ends in each dent of the straight comb to reach the front roll side by side in the order originally intended.

Next came the following paper on

STANDARDS OF COTTON YARN

By ARTHUR T. BRADLEE, of William Whitman & Co., 78 Chauncy St., Boston, Mass.

A few years ago this Association appointed a committee to look into the question of a standard sale note. A large amount of work has been done by that committee in regard to cloth and a standard sale note for cloth has been adopted and endorsed by this Association, but I think I am correct in stating that it has not come into general use. This may be partly attributed to the condi-

ARTHUR T. BRADLEE.

tions of trade prevailing in the last few years and the desire to put no possible obstacle in the way of making a sale, for, as one manufacturer stated to the writer, "any sale note today looks good to me, I don't care what form it is written on." Undoubtedly trade conditions have hindered the adoption of the cloth sale note, but, in my opinion, far ahead of any such reasons are other fundamental obstacles which have prevailed and which will continue to prevail until we have more general enlightenment on the subject with which we are dealing.

We cannot have a standard sale note until we have a standard on which to make the sale note. That standard must not be the standard of the seller nor the standard of the buyer, nor can it be a standard of compromise. It must be a standard of fact and, gentlemen, we do not today know the facts. One or two individuals of this Association have made some investigations in the past and are now making certain other investigations along this line. They are blazing the way, but this work of ascertaining the fact should not be left to an individual or individuals, who, as a rule, can only give it spasmodic attention. It should be taken up by some public body of recognized strength and

national reputation;—a body which by its very standing in the community would be the natural authority for such facts. In good times or bad times a buyer or a seller may well hesitate to sign a sale note containing a lot of conditions about which he is ignorant and about which he has no easy way of ascertaining the truth.

The time is ripe for some organization connected with the textile trade to take up this work and establish for this country proper standards for the testing of cotton yarn and fabric along similar lines to those by which they have been established in foreign countries. With the new demands of trade and the increasing competition of

VIEW IN EXHIBITION, THE ALLIS-CHALMERS COMPANY

our times this standardization has got to come and on this work The National Association of Cotton Manufacturers, the oldest and strongest organization of the cotton trade, should not allow any other organization to get ahead of it. The United States Government at Washington, in their Department of Commerce and Labor, are carrying on splendid tests at the present time on just these lines with the idea of drawing up specifications for Government purchases and the testing of those purchases when received, to see that they are up to those specifications. They have adequate laboratories fitted up for this special work and they are endeavoring to do the work on strictly scientific lines. They realize, however, that they are not manufacturers, and they have shown every desire and wish to cooperate with us. I have talked with the Government officials who have the work in charge; I have seen the laboratories and on behalf of your committee I am doing what I can to cooperate with them, but as a representative of The National Association I am ashamed when they ask me for our standards and our reasons for adopting them for, what are our standards, what real facts have we got to give them and on what authority are those facts based?

The Yarn Sub-Committee, of which I am a member, have hesitated in their work, partly awaiting the developments of the situation with the cloth contract, but especially because our early meetings showed wide divergence of opinion as to the fundamental facts necessary for even a start on the standardization of a contract. On the proper or allowable variation in count, twist and breaking strength or the proper humidity conditions under which yarn should be tested, you can ask a dozen manufacturers with as many varying replies and hardly any reply will be based on any real correct investigation of the facts. A professor of one of the textile schools has stated, as I understand it, that the extreme variation from count should be one number either way, but one number on a No. 10 yarn is 10 per cent., while one number on a No. 100s yarn is only 1 per cent. Such reports, in my opinion, are not based on fact and yet if such people as this express such views what can we expect from the ordinary buyer, who uses textile products but is not at all familiar with their manufacture. Still less can we expect intelligent verdicts from ordinary juries on textile cases under trial in the courts.

We publish tables of standard breaking strength and we talk of breaking strength and size as if they were practically constant in the same bobbin or the same skein, ignoring absolutely the hygroscopic conditions of the yarn at the time of testing. This is all wrong. Comparative tests for breaking strength and, to a less extent, tests for size are of no value whatever unless we know that the hygroscopic conditions of the yarn at the time

of testing is the same in each instance. A few weeks ago a large manufacturer wrote to my firm that from all spinners he was finding a great deterioration in the strength of the yarns he was then receiving over those of last summer and that spinners had attributed it to the greater strength of last season's cotton.

Now, this explanation was perhaps partially true, but the real reason for the difference was due to the fact that the yarn tested was in an absolutely different condition as regards humidity and it was the difference in such condition that caused the apparent great deterioration in strength. In the summer his tests were made in a room where, by open windows and natural causes, the atmosphere and the yarn itself contained approximately the natural moisture of the outside air,—while recent tests were made in an atmosphere taken into th building at around zero degrees of temperature and artificially heated to about 70°, with its natural moisture evaporated and the yarn exposed to this atmosphere was equaliy dry. It was not in its natural condition and did not show its natural break. When put in the same condition the correct strength was reestablished and the trouble was gone. The manufacturer was astonished; it was an entirely new thought to him.

When I state to you that half a dozen skeins of yarn that had been in an office building for a few days broke at an average of 83 pounds and the same skeins after being exposed for a night to a damp outside atmosphere, but protected from rain, broke on the same machine and by the same operator at an average of 93 pounds, and a cone of yarn under a regain condition of 6 1/2 per cent. broke at 87 1/2 pounds, while the same cone when transferred into an 8 1/2 per cent. regain condition increased in break to 103.3 pounds, a difference of 18.9 per cent., you will see the futility of comparative tests when conditions are disregarded.

There is no doubt but what thousands of pounds of yarn and cloth have been rejected and returned by honest buyers through such misleading tests and for a buyer to buy or a seller to sell yarn on a guaranteed breaking strength is worse than folly, unless they know the conditions under which those tests are to be made. Yet this is common practice. When the United States Government write me that the same reeling shows a difference in size of the yarn of over 5 per cent. between tests made under 45 per cent. and those made under 85 per cent. humidity, you will see also the necessity of knowing the hygroscopic condition of the yarn in times of dispute as to its sizing.

There is a woeful lack of knowledge on this subject among spinners as well as users of yarn in this country and it is time that the trade were enlightened. Foreign countries have for years been educating along these lines, both the manufacturers of textile products and the users of textile products, with the result of much elimination of controversy between buyer and seller, and when such controversies do arise they offer the means of their practical and peaceful solution through established authorities:

1st. The conditioning house where tests can be conducted under uniform conditions known alike to the buyer and seller

2nd. By the tribunals of arbitration founded on the work of those conditioning houses.

In England they have a sale note for cotton yarn.

All that it says about count, strength, twist, etc., is as follows:

"In case of dispute as to counts, length, weight, or condition, the yarn shall be tested by and according to the rules of the Manchester Testing House, and its certificates shall be binding on both parties, who, however, shall have the right to be represented when the samples to be tested are drawn.

"Either buyer or seller has the right to ask the Manchester Testing House to repeat the test, and in that case the average result of the tests shall be taken as final and binding on both parties."

The Manchester Testing House, as you see, is the recognized authority. Their tests are made under certain published, standard conditions. What are the standard conditions in this country for making tests? Who is the recognized authority? The so-called systematizing of business of today is developing the idea of specifications for buying. Such specifications are usually drawn up by the system expert, by chemists, or others, who know nothing about the principle of textile manufacture and who naturally turn out specifications that are impossible of fulfillment or unjust to the spinner. In fact, the most of these specifications call for the yarn or cloth to stand the test on buyer's apparatus as he may decide to test it, without any information as to what the apparatus is or under what conditions the tests are made.

It is a wonder that we have disputes and differences between the tests of the manufacturer and those of the buyer. They must always exist until some uniform system under uniform conditions is adopted by the trade. The way to do this is to establish a national conditioning house and laboratory for this country similar to the Manchester Testing House. I believe it should be established by and be under the control of this Association as a recognized authority, first, to establish the uniform conditions to be adopted and then to spread its information before the entire trade, with its reasons for adopting the standards, as does the Manchester Testing House, where tests are carried out not only for firms and individuals in Manchester, but in all parts of Great Britain, as well as France, Germany, Holland, Turkey, India, and other countries.

On account of my personal connection with the Massachusetts Institute of Technology, I have been able to arrange during the past two years for certain experiments and theses on this subject by graduating students, but these have necessarily been very incomplete because of the small amount of time that can be given to them and because of the lack of the exact kind of a laboratory necessary for the work. I do not speak with authority, but I believe the Institute would welcome the fitting up by this Association of such a laboratory in their new buildings about to be erected, and that they would then, if desired, furnish for a nominal sum trained experts to make such tests from time to time as would be necessary.

I am aware that there are many who do not be-

lieve in such innovations. The methods of the past have been good enough for our fathers, they should be good enough for us, but, gentlemen, scientific methods in all forms of business are pushing to the front with rapid strides. The Institute of Technology of which I have spoken, a strictly scientific school, is only fifty years old, but today it is recognized as one of the greatest schools in the world. It is in step with the times and in the more severe competition that awaits us, we, of the cotton manufacturing trade, must get in step also. We cannot know too much about our business and for the honest manufacturer it is well that the buyer of his goods should be equally posted. I believe that there was never greater honesty in business as a whole than there is today and that most of the differences of the textile business arise through ignorance of the real conditions and the real troubles in dispute. I am sure that the establishment of a national laboratory and conditioning house would help smooth the paths of all of us. It must come some time. Is it not time now and is not this the Association to establish it and to make it the authority of the trade.

Until that is done by this Association or someone else we can expect little from a standard contract, other than in mere details of tare, selling terms, etc., about which we have now few disputes. On the important matters we can each form our own individual standard, but neither you nor I nor any committee of us can form standards for others to abide by until we have recognized public facilities for establishing what those standards shall be and open up for easy access to the buyer and the seller alike the same facilities for their own conviction as to the justice of the standards so adopted.

Mr. Bradlee's paper had the close attention of the audience and at its conclusion Secretary Woodbury read the following letter from S. W. Stratton, director of the Bureau of Standards at Washington.

At the solicitation of various branches of the textile industry, the Bureau of Standards has undertaken to secure information which will assist in the establishment of uniform standards in the textile trade. Textile laboratories have been equipped with the best and most modern apparatus and laboratory assistants, graduates from textile schools having had mill experience, have been secured for the work. Considerable time has been devoted to the study of methods of tests, to the preparation of specifications for the Government textile materials, and to the testing of deliveries upon specifications. This work is still in its development stage, and as yet no printed matter describing it has been published. The Bureau hopes to issue during the summer several circulars of information upon textile subjects.

Through the cooperation of the yarn committee secured by Mr. Bradlee, Dr. Woodbury of The National Association of Cotton Manufacturers, and a number of manufacturers, the Bureau has been furnished with valuable samples of cotton yarns. These have included singles, two-ply, and three-ply yarns ranging from Nos. 14 to 100, inclusive.

THE G. M. PARKS COMPANY'S SPACE AT THE TEXTILE EXHIBITION.

The following determinations have already been made upon the single and two-ply yarns:

1. Accurate determination of yarn count and the errors found in the spinners' mark.
2. Variation of yarn counts, showing the average, maximum, and minimum respectively. These have been computed in yarn counts and also in percentages.
3. The determination of yarn counts by two methods, (a) by working with 120-yard samples; (b) by working with 30-yard samples.
4. Numerous tests showing the influence of humidity upon yarn-counts and yardage.
5. Twists and variation of twist per inch.
6. Tensile strength by single thread tests, also 120 yards tested at one time. Direct comparison is drawn from these two methods of testing.
7. The influence of humidity upon the tentile strength of cotton yarns (singles) has been ascertained by testing 110 individual yarns at 45, 55, 65, 75 and 85 per cent. relative humidities, making a total of 550 determinations in all.
8. An investigation with which yarn count determinations can be made by different observers.
9. A summary showing separately the variations in yarn-count, twist, and tensile strength of yarns furnished by three distinct mills.

Parts of the investigation now in progress are as follows:

1. Can carded yarns be spun as uniformly as combed yarns.
2. Comparative investigation upon the variation of yarn counts in "singles," two-ply, and three-ply yarns.
3. Definition of ply yarns, the take-up by the twist, and the ratio of weight as compared with single yarns.
4. Investigation of the loading of cotton yarns.
5. The tolerance which should be allowed for yarn counts, twist, tensile strength, loading material, etc.
6. The percentage and "regain" of moisture in commercial grades of cotton yarns.

For the intelligent working out of these problems the Bureau asks the cooperation of The National Association of Cotton Manufacturers, and will welcome suggestions or any information its members or committee may supply.

The above outline will give an idea of what has already been accomplished, and what is intended to be done in the future.

The Bureau wishes to acknowledge its obligation and to extend its thanks to those of the Association who have already so generously assisted with materials.

E. H. Marble emphasized the points made by Mr. Bradlee by giving an account of several interesting incidents that had occurred in connection with the measurement of woven goods. The paper on the history of cotton classification by Prof. R. J. H. De Loach was read by title.

The closing session on Thursday afternoon was occupied with the election of officers and new members and the reading of the following papers:

STEAM PLANT EFFICIENCY IN TEXTILE MILLS

By RAYMOND L. FOSTER, Engineer, Fitchburg Yarn Co., Fitchburg, Mass.

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Severe competition among mill engineers, probably caused by manufacturers calling for lower cost per spindle, has in many cases been the cause of poor efficiency in the steam plant. Boilers, chimney, engine and the builders we must have.

The auxiliaries that are necessary for economy, and to utilize our by-products, we should have, but don't always get. In some plants we get them and they are too small or of an inferior grade. Forty-five dollars per horse power has been set by many mill engineers as a fair price for a modern, economical power plant in textile mills, using from 1,500 to 2,000 horse power. It can be built for $42.

I can cite you a mill in Massachusetts of 1,800 horse power, its power plant costing $70,000, or $40 a horse power, which is running at a cost of $16.68 a horse power per year. To do this the money must be judiciously spent, every cent put into quality. You cannot have tile brick walls and frescoed ceilings, neither can you spread your plant over an acre of land. We have a mill in Massachusetts, put up within the last five years, that has tile brick walls, polished floors, overhead electric cranes and brass bands on all pipe covering, that are kept polished. They even went so far as to put gold leaf on the smoke boxes of their boilers. Their entire plant was built on these lines. You cannot duplicate this plant for $42 per horse power.

Luxuries do not pay dividends or improve the efficiency of the plant, but do increase the fixed charges. A mill of this style will say you cannot do a horse power on $16.58 with an 1,800 horse power plant.

INSTALLATION

We are now at the most critical stage of our subject; what to install and how to install it. There have been many city hospitals built where physicians can experiment, but as yet the only hospital our mill engineers have had is the practical plant at the expense of the stockholders and patience of the management. Many a good slice of the dividend has been spent in ripping out and building over after the plant has started.

Let us start and build a modern steam plant of 2,000 horse power and avoid these changes. Begin right by placing our engineer, who is to have charge of the plant when finished, on the ground at the start. He makes the best inspector, as it will be up to him to run it and get results later. We must bear these points in mind, for they mean the success of the plant:

First, get all the possible B. T. U. from the coal into the steam.

Second, put the pressure or heat units in the steam at the boiler into the engine.

Third, avoid all unnecessary by-products and utilize all necessary by-products possible.

Fourth, this plant complete must not cost over $84,000.

BOILERS

In selecting the type of boilers, we must have one that will stand a safe working pressure of 200 pounds per square inch, the weakest part not exposed to the fire; one that will have the least loss by radiation, one that will have no brick work to keep in repair, and a boiler that will take the least floor space, also one that will give us dry and superheated steam. We want a boiler so designed that by good circulation and proper ratio of grate surface to water heating surface, not less than 1/50 or 1 to 50, we may evaporate 30 pounds of water with 10 square feet of heating surface under normal conditions and natural draft.

TYPE OF BOILERS

We will install the vertical fire tube type of boiler, being, we believe, the best adapted for our particular plant. Why? Because there are no other boilers that can so well fill all these requirements.

In January, 1883, Capt. Charles H. Manning designed and built the first Manning boiler. In October of the same year he built a battery of 16. These boilers run for 26 years under the same pressure they were started with, 110 pounds per square inch, and cost but $15 a boiler per year for repairs. Up to the present time no boiler of this design, properly constructed and operated, has failed.

The vertical boiler has internal five boxes, with no material losses from radiation and no brick work to crack and destroy efficiency. Building our boilers with a fire box 6 feet from grate to tube sheet, and 18-feet tubes, gives us a good combustion chamber and dry steam with a superheat of 50° to 70°, according to the height of the water line. With the new Auto welding process we will weld the vertical seams in the fire boxes, thus eliminating all danger of fire cracks and leaky caulking edges. As for floor space a Manning boiler of 250 horse power will take a space 9 feet in diameter.

TEXTILE MACHINERY EXHIBITION, THE CARRIER AIR CONDITIONING COMPANY.

NUMBER OF BOILERS

The next step is, how many boilers do we need? Shall we put in a spare one? No man will put his money in a national bank and not use it; neither will we put our money in a spare boiler to lay idle. A modern cross compound engine of 2,000 horse power will run on 12.5 pounds of water. One-half a pound added for auxiliaries equals 26,000 pounds per hour to be evaporated. We agree that three pounds of water per square foot of heating surface is most efficient, and with this allotment of work to heating surface it is possible to get 33 1/3 per cent. overload continuously with mechanical draft. Let us see how this works out, 26,000 divided by 3 equals 8,666.66 square feet heating surface required for the whole plant. Let us divide this into four units and see what we get:

8,666.66 divided by 4 equals 2,166.66. The normal capacity for each unit is 2,166.66 which multiplied by 3 equals 6,499.98 pounds evaporation per hour. Sixty-five hundred multiplied by 1.33 1/3 per cent. equals 8,667 pounds evaporation per hour at 33 1/3 per cent. overload. Now if it becomes necessary to cut out one of our boilers at any time we can evaporate 8,667 multiplied by 3 equals 26,001 pounds of water per hour, the required capacity. Therefore, by installing four boilers we get the best efficiency and save the price of a spare boiler, extra floor space, valves, piping, etc.

TRIMMINGS

Shaking grates, automatic water controllers and soot cleaners are three trimmings necessary for good results. The grate in a vertical boiler sets below the fire door, therefore the old slice bar and flat grate are impossible for good firing. Automatic water controllers give steady feed, and if we want clean boilers Saturday morning as well as Monday, we must install soot cleaners.

ECONOMIZERS

Gases leaving our boilers running normal should be about 475°. This, one of our largest by-products, we cannot afford to lose, although many do. If in the mill you were making 10 per cent. waste, would you be willing to throw it away? No, you watch very closely to see that every pound is saved and sold. Let us put in an economizer and save a large per cent. of these heat units. It must be remembered that this apparatus is constantly under greater pressure than the boilers, and it pays to invest in the best. In principle they are alike, but in design of details and durability there is a vast difference.

We won't make the mistake of many and buy one too small. It is a custom to figure an economizer on a 40-minute basis. That means that it takes the amount of water to be evaporated 40 minutes to pass through it. That is too small; a 50-minute basis is better. It may not raise the maximum temperature much but it will the minimum. Many will say that the up-keep of an economizer, with the interest and depreciation, will balance the savings. Let us see how this works out in our plant. A well equipped plant of 2,000 indicated horse power will run on 1.5 pounds of coal per horse power per hour. With a 54-hour week and 52 weeks in the year the total coal consumption will be 3,760 tons. It has been proven by numerous tests that an economizer will save from 8 to 10 per cent. In our case that would be 327 tons, and at $4.50 per ton the gross saving would be $1,471.50. Our machine will cost us $4,-165. Allowing 10 per cent. for interest and depreciation and 2 per cent. for maintenance, which is more than ample, or $500, we now have a net saving of $971, or 23 per cent. of our investment. This machine will pay for itself in four years. We cannot add to the cost of this any part of the building, for it takes unoccupied space. Some men say they cannot install an economizer, it would kill their draft. The loss in draft from one end to the other will average about .2 of an inch. It is not generally understood that with the extra heat units given the feed water by the gases, less call is made upon the boilers. This means thinner fires, less coal to be burned and less gases to be taken care of. Hence the loss of draft by the economizer is offset.

(To be continued in June)

A SAW TOOTH ROOF WEAVE SHED

By ALBERT GREENE DUNCAN, 70 Kilby St., Boston, Mass.

The only excuse for presenting a paper on so well established a type of mill construction as the modern Saw Tooth Weave Shed is that the building under consideration embodies several new principles of construction, which without material increase of cost have overcome many of the objections previously existing in this type of building.

The building was designed to give the maximum light and the greatest area of floor space free from columns or other obstructions. For this reason all the shafting was placed in the basement, the looms being driven from below. This, therefore, called for a one-story building with unfinished basement.

Design was first made of the most economical loom layout in reference to the looms per weaver and per loom fixer's section, and as Northrup looms were to be installed they were grouped in blocks of six instead of the conventional four, which would be necessary if plain looms had been used. Further, six rows of looms were designed for each bay, rather than four, the method of construction adopted making it possible to provide for wider bays than in weave sheds of the standard type.

With these preliminary remarks we will take up the construction in detail. Reference is made to the sections of the building reproduced herewith, Fig.ure No. 1 showing a complete cross section of one bay and Figure No. 2 showing an enlarged detail of the construction of the gutter and skylights.

The basement averages from five to six feet in height under the beams and contains shafting, pulleys and two motors for driving the looms, long drop shafting hangers being used to give adequate belt centers. The basement walls are constructed of monolithic concrete without windows, except where necessary for ventilation, and the floor structure is carried on concrete piers under the columns and intermediate posts on concrete footings. Th bays in the basement are uniformly nine feet in width by approximately twelve feet span, the floor timbers being of 10 by 12 inches southern pine supported on 10 by 10 inches southern pine posts and on concrete columns.

The floor consists of a four-inch planking of southern pine surfaced on one side and not splined or tongued and grooved, reenforced by one-inch rough intermediate flooring running diagonally across the lower floor planking, care being taken that this diagonal floor should be securely spiked down to each floor plank. On this was placed a 7/8-inch maple surface floor made up of strips not exceeding three inches wide and not tongued and grooved, experience having shown that this floor will resist the inevitable shrinking and swelling

due to frequent washings better than a floor that is tongued and grooved.

The walls of the shed are built of concrete blocks molded wet in wood forms, each block being 21 inches long, 10 1/4 inches thick and 8 inches high with two hollow spaces through each block. These blocks were made upon the ground in molds, each mold holding eight blocks, the concrete being mixed wet and the blocks being allowed to dry three days before the molds were removed and from a week to ten days before being placed in the wall. This enabled the wall to be made 10 1/4 inches thick and yet by its hollow construction experiments have proved it is superior in heat retaining properties to the conventional 18-inch brick wall. One side wall 252 feet long is built of wood to provide for future extension.

In order to avoid special forms of concrete blocks no pilasters were included, but the wall was reenforced at each girder bearing point with columns made of two 6 by 3 1/2 inch ells and built into the walls.

Windows were omitted in the side walls and in one end, small windows being placed in the end of each saw tooth high up for ventilation only, and on the north end are windows of ordinary sash and glass construction, not for the purposes of illumination, but for ventilation and for the possible effect upon the operatives of working in an entirely closed in room.

The roof structure is of particular interest and after careful study it was found that by the use of steel trusses wider bays could be secured, thus accomplishing results desired of grouping the looms six rows to a bay and obviating 50 per cent. of the alleys which would be encumbered with posts.

The steel structure is carried on cast iron columns six inches in diameter and on these rest 24-inch 80-pound I-beams having a span of 34 feet, 3 1/2 inches

The steel trusses consist of riveted members delivered on the ground all fabricated of a height of 8 feet, 6 inches and a span of 27 feet. The trusses are riveted to the side of the I-beams, as is plainly shown by section in Figure 2. This simple method of connection was adopted for securing greater stiffness in the roof structure and also for bringing the bottom of the skylights as near the cloth surface of the looms as was possible. The longer span and consequent height of the trusses employed also allowed the supporting columns to be comparatively short, same being 11 feet 2 inches from the floor to the top of the column, without reducing materially the cubical area of the room per operative.

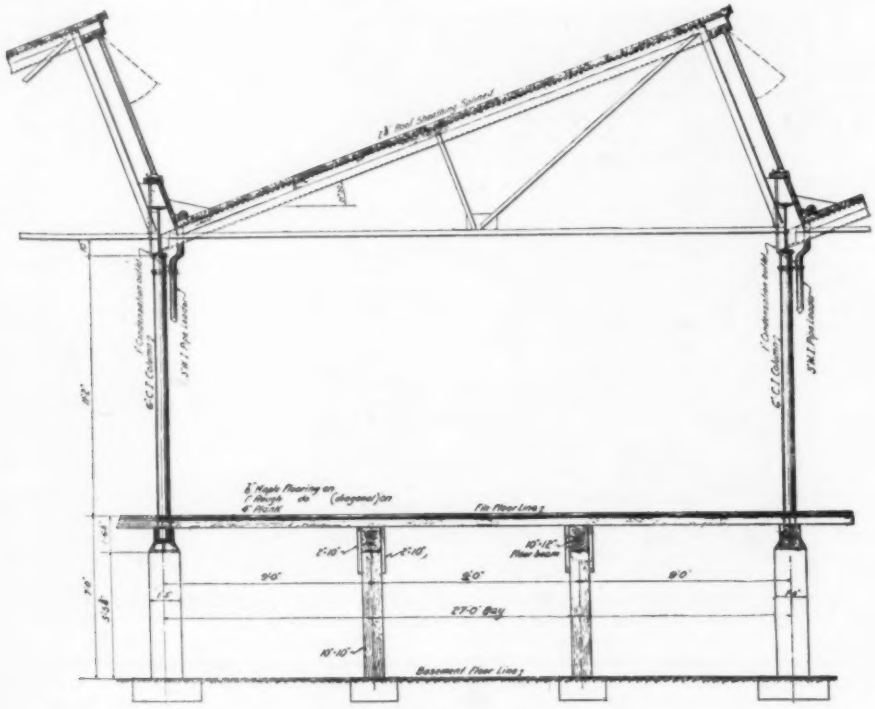


FIG. 1. CROSS SECTION OF ONE BAY.

Experiments made previous to the construction of this shed showed that the diffusion of light or the causing of shadows on the cloth in the loom was directly dependent upon the distance the skylight sills were above the weaving surface. In some weave sheds seen, which were very high

studded, shadows could be produced by the hand being held approximately 12 inches above the surface of the cloth, whereas, in the shed under consideration, shadows are hardly perceptible when the hand is held four inches above the surface of the cloth.

The roof consists of three-inch splined sheathing laid on spiking strips bolted to the side of the top chord of each truss, the trusses being spaced 9 feet apart. Great care was taken in the design and construction of this roof that no difficulty run down through the floor into the basement for connection to the sewers. This gave a distance of 27 feet between leaders and this space was divided into two equal parts and the valley filled in by cricketting, giving a pitch of approximately 14 inches in 13 1/2 feet, so that the length of the valley to be drained by each roof conductor was 13 1/2 feet on each side. This design has been very successful and no leakage of the roof has occurred.

The building was erected on the "Cost Plus a

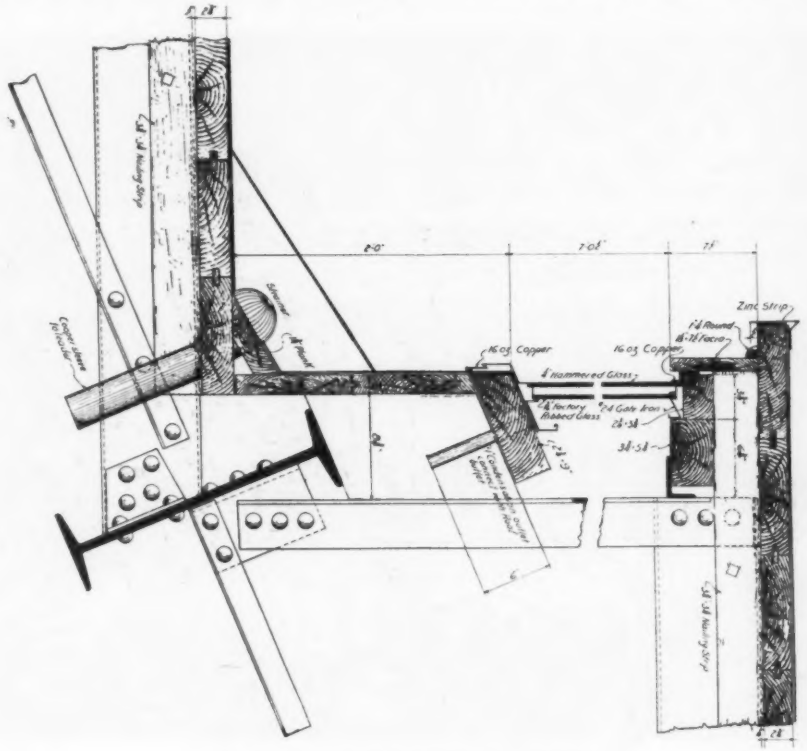


FIG. 2. DETAIL OF GUTTER AND SKYLIGHT.

from condensation on the over-head steel structure should be encountered, and it was felt that this could be avoided if the steel work were kept at all times at the same temperature as the room, and so in no case was any portion of the roof exposed to cold air allowed to touch the steel structure, the top of the nailing strips being raised in each case from one-fourth to one-half inches above the top of the trusses and the valleys of the roof being kept at about four inches distance from the supporting I-beams.

Various methods have been adopted in weave sheds to prevent valleys filling up in our climate of heavy snows and sudden thaws. Some weave sheds have a uniform pitch from side to side and drain out of the end of the valley.

In the shed under consideration at each of the posts a leader of three-inch wrought iron pipe was

Percentage Basis" and cost without equipment $47,628, including engineering fee and contracts profit. The cost per square foot of area figuring on the basis of 36,000 square foot is as follows:

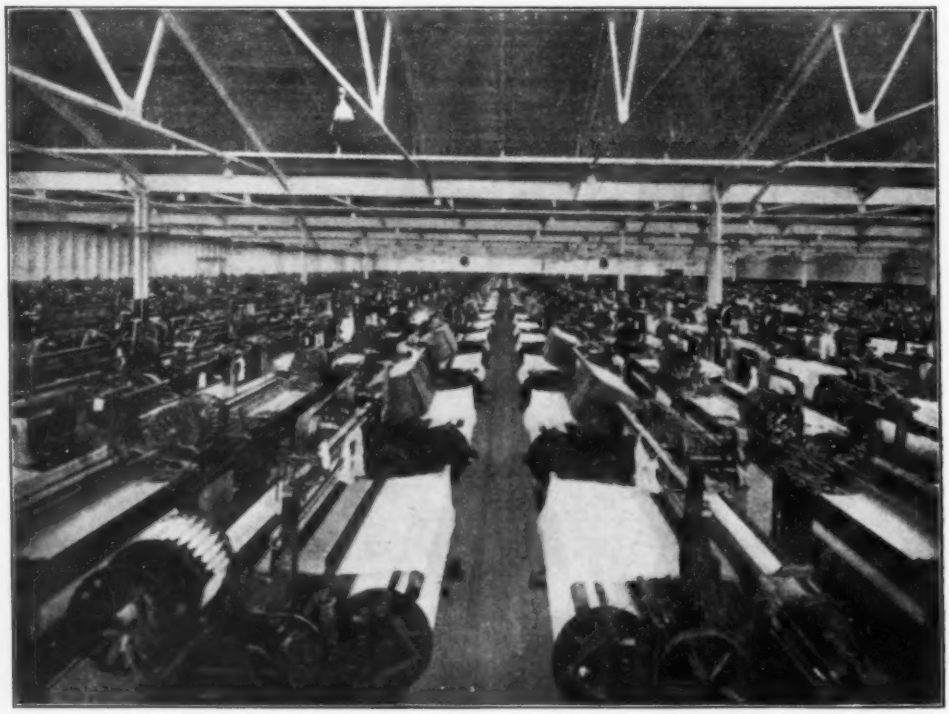
$1.323 per square foot of area divided as follows:

Excavation	$ .048
Concrete footings and foundations	.079
Structural steel	.180
Posts and girders	.079
Flooring complete	.274
Concrete blocks (making and setting)	.079
Wood wall	.034
Roof complete	.360
Doors and windows	.014
Painting	.045
Engineering	.076
Superintendents, clerks, etc.	.045

Construction plant and tools		.010
Total cost		$1.323

The above costs are based on the following unit prices for materials:

Structural steel and columns delivered on the ground	ton	$45.65
Concrete for foundation wall, columns and footing, including forms	cu. yd.	10.27
Cost of labor for electing steel work ..	ton	5.74
Timber (rough) long leaf yellow pine	M ft.	29.75



SAW TOOTH WEAVE SHED. INTERIOR VIEW LOOKING SOUTH.

Floor plank, long leaf yellow pine ...	M ft.	28.25
Splined roof plank, long leaf yellow pine	M ft.	29.00
Siding and intermediate flooring	M ft.	21.00
Top mable flooring	M ft.	33.00
Portland cement	bbl.	1.23
Broken stone, net	ton	1.20
Skylights delivered and erected	sq. ft.	.41

THE FRANKLIN DYEING SYSTEM

By JOHN C. HEBDEN, Providence, R. I.

In presenting a description of this system of manufacturing colored goods it is not necessary to discuss the advantages that might obtain in the manufacture of colored goods if the same system of transfer and winding operations as obtains in the manufacture of grey goods were employed, but to present merely the results which are obtained in practice without any theoretical considerations. The system is far advanced beyond the theoretical stage of development, and is now a commercial proposition tried out in mills and in the job dyeing trade.

This system is the result of the cooperation of a practical mill man and a practical dyer and chemical engineer. While the system required for its development the perfection of a dyeing machine built and operated on entirely new principles and methods, the system should be considered as a whole, as an aggregate of units or operations and not as a single operation, machine or unit. By this system all unnecessary operations in winding for colored work are eliminated. The operations are reduced to the simple operations required for the manufacture of grey goods. By the use of this system it is possible to reduce the time required for the manufacture of a piece of colored goods to one-third the time required for the manufacture of goods by the warp method, and to about one-eighth the time for the manufacture of goods by the raw stock method. At the same time, as a general proposition there is a saving of 75 per cent. in labor in the dye house, 50 per cent. in steam, and from 20 to 30 per cent. in dyestuffs. There is a gain in strength in the yarn, running from 2 to 10 per cent. The saving in the winding charges are practically one mill per number per pound; that is, on number 20 single yarn there is a saving of two cents per pound.

If it were not for the custom and practice in the dye house it would be unnecessary to have yarn either in the form of skein or ball or chain warp. It is the dye house and the dye house alone which compels the manufacturer to resort to putting up or handling his yarn in either form. This dye-house requirement introduces into the practice of manufacture unnecessary, and at the same time, expensive winding and transfer operations.

That the details of the system may be fully set forth, compare the manufacture of warp and filling by the chain method with this preparation of warp and filling. By the warp method, taking the yarn

JOHN C. HEBDEN.

from the spinning frame, the operations for preparation for the loom consist of the following manipulations:

1. Spooling.
2. Ball warping.
3. Boiling out, doubling and wrapping.
4. Dyeing, requiring at least four operations.
5. Drying.
6. Splitting and unwrapping.
7. Beaming.

The warp is now prepared for the slasher, and has been handled or rolled back and forth during these operations eleven times. If this yarn were prepared for filling instead of being beamed, it would be quilled, requiring the same number of operations. In preparing warp or filling according to the system, the yarn is taken from the spinning frame and wound on the tube. In this package the yarn is not moved or disturbed during the dyeing and drying operations, and is taken direct to the creel and section beamed, thus preparing the warp for slashing; or if the yarn is for filling, it is taken to the quilling machine, thus completing the operation. In other words, the system cuts out nine winding or unwinding, or rolling or unrolling operations, thus saving the attendant strain and loss in strength in the yarn, making the work run easier, and at the same time substitutes for the regular winding operations more efficient operations which are at the same time as cheap or cheaper than the old. The cost of spooling by the ordinary method is, generally speaking, the same as the cost of winding upon the tube. In many cases the cost of winding is lower than the cost of spooling. The cost of section beaming, however, is much lower than the cost of hand beaming from a chain warp, so that the following items have been cut out of the cost of the production of warp:

1. Expense of ball warping.
2. Expense of boiling out, doubling and wrapping.
3. Expense of splitting and unwrapping.
4. A part of the expense of hand beaming.

At the same time the labor cost in dyeing and drying is 75 per cent. less than by the chain method.

There are two methods of winding from the tube for filling, namely:

1. Over end delivery, using the Universal quiller.
2. The rotating delivery, using the Whitin quiller.

Either operation is cheaper than the chain quilling, so that the savings in preparing filling are practically the same as in preparing warp.

Comparing the raw stock method with this system, there are the followings savings:

1. Saving due to the increased production on account of spinning grey cotton as against colored cotton.
2. Saving in the value of grey waste as compared with colored waste.
3. Saving in the strength of staple, making it possible to make stronger yarns out of lower staple than in raw stock dyeing.
4. Saving in time required, thus reducing interest charges. The total time required to manufacture colored goods is reduced to the number of days that the raw stock method requires weeks.

It is hardly possible to spin good yarn from raw stock dyed cotton much finer than thirty single, so that the raw stock system applies only to coarse yarn, while with this system the finer the yarn the greater the savings. These savings in the carding, spinning and other departments of the mill are sufficient to make the total savings over raw stock methods fully as great as the savings made over the warp method. The transfer of winding operations being the same by the two systems.

As compared to the manufacture of colored goods by using skeins instead of warps, the expense of skein winding and back winding is entirely eliminated. This is found in practice to be practically a mill per number per pound. The quality of yarn when dyed in the package is far ahead of that when dyed in the skein. Soft yarns cannot be handled well in the skein method, while by this system soft yarns are handled with ease and improved in quality.

Outside of the savings made in handling yarn in the winding operations, the speed at which the work can be put through the mill counts for a great deal in estimating the advantages of the system. Colored goods have been made and delivered to the finishing plant in four days from the

time the yarn was taken from the spinning frame. This was working under ordinary conditions. This might be cut down if everything were prepared for a test.

Thus far the advantages that are offered over the regular competing methods for preparing yarns for colored goods have been discussed. Nothing has been said with reference to the details of operations. In the preparation of filling, if the Universal quiller is used, the question of yardage per package does not enter into the discussion, but for the preparation of warp or for the preparation of filling using the Whitin quiller, the question is all-important. From actual tests in the plant of the company, the amount of yarn on the tubes when wound for warp has not varied more than 1 1/2 per cent. in yardage among the different packages. This yarn is in condition to be rewound at the very low cost, making an absolute saving of this yarn, whereas by the regular methods the amount of yarn spoiled in starting the ends of the warps through the dyeing processes and in waste on beams and slasher amounts to considerably more than the percentage variation in the length of yarn on the tubes. This yarn is a total loss. In making the number of ends necessary for a warp it is necessary simply to estimate the number of packages required, make the packages the weight required for the yardage wanted and dye this in the machine on the necessary number of holders. The company has in operation today the largest package dyeing machine in the world, which is capable of dyeing 1,057 tubes six inches long, or 2,114 tubes three inches long, providing the number of packages per holder are on the regular system, eight packages per holder. If the number of packages per holder be increased one package, making the total nine, there would be 1,289 packages six inches long, or 2,578 packages three inches long. The weight of this yarn would run from 12 ounces to 2 1/4 pounds per package, making a yardage equal to the chain warp method, and a very sizable amount of yarn dyed at one time. By a simple arrangement two machines of this capacity can be coupled together and run in tandem, making it possible to dye from

THE UNITED STATES GUTTA PERCHA PAINT COMPANY'S BOOTH AT THE TEXTILE SHOW.

1,000 to 2,000 pounds, or from 2,000 to 4,000 pounds of yarn at one time. No system for the mnaufacture of colored goods has ever attempted or approached these quantities. The next smaller machine will handle on an average 750 packages six inches long or 1,500 three-inch packages. The sizes run down to the smallest, which will handle 8 or 9 six-inch packages, or 16 or 18 three-inch packages. Any number variations between these figures can be worked out, dyeing in each package of yarn that with ordinary care can be made to vary in length not over 1 1/2 per cent.

To sum up the advantages of this system over the ordinary methods, it can be positively stated that the savings in winding, the savings in dye-house labor, savings in steam and the savings in dyes made by this system will pay for the total cost of the installation of a plant handling 3,000 pounds of average number yarns (say 30/1) in one year and leave the mill a profit. In addition to these advantages it is possible to dye many classes of colors better than they are dyed by the ordinary methods. This is particularly true of the vat colors, which can be dyed by this system with as much ease and certainty as ordinary direct dyes. With this system of winding and dyeing it is possible to make many styles of goods which are now made with bleached warp and filling by using grey warp and grey filling. This is accomplished by weaving in yarns colored with dyes which are fast to bleaching and bleach the goods in the piece, thus saving in the initial cost of manufacture and improving the product. This is the greatest step in advance that has been made in the preparation of colored yarns for either warp or filling. The process is in daily operation at the plant in Providence, which is delivering dyed and bleached yarns to meet the most exacting requirements both as to fastness and to finish.

President-elect Greene was unavoidably detained at Washington by important business and was therefore unable to make any formal acceptance when elected president of the association. His business experience and active interest in the general welfare of the textile industry make it certain that he will prove a worthy successor to the long line of presidents who have preceded him. The committee on resolutions reported the following, which were unanimously adopted:

The Committee on Resolutions of the National Association of Cotton Manufacturers thanks His Honor, John F. Fitzgerald, Mayor of Boston, for his address of welcome, and also thanks Hon. L. P. Padgett, M. C., Arno Schmidt, Jonathan Thayer Lincoln, Dr. S. W. Stratton, R. L. Foster, Prof. R. J. H. DeLoach, E. N. Murti, Edwin Kenyon and the members of the Association for their several addresses. The Committee offers the following resolutions:

Whereas: Various bills relating to the sale and purchase of cotton to be delivered on contract on the cotton exchanges of this country are before the Committee on Agriculture;

Whereas: Such legislation, in the opinion of this convention, would result to the detriment of all the people, be they consumers, laborers, spinners, manufacturers of goods, or the cotton trade in general, therefore

Be it Resolved: That the National Association of Cotton Manufacturers now assembled in convention in Boston, Mass., deprecate such legislation, believing that cotton exchanges properly conducted are conducive to their best interests, and respectfully request their Senators and Representatives in Congress to protest against such legislation.

Be it Further Resolved: That a copy of this resolution be sent to the chairman of the Committee on Agriculture of the Senate and the House of Representatives, and the Senate Committee on Interstate Commerce and to the individual Senators and Representatives in Congress.

Whereas: There is an increased demand for the American long staple cotton which is exceeding the yield; be it

Resolved: That the Board of Government of this Association express their desire that the cotton planters of Imperial Valley, Cal., shall devote themselves to the cultivation of American long staple cotton, which should give them a higher remuneration than any other cotton, and that they refrain from planting the short staple American Upland cotton and destroy the seed, in order to prevent the deterioration of the long staple cotton by hybridization.

Resolved: That the California cotton planters be requested to pack their cotton bales with covering similar in character to the Egyptian cotton with its closer woven wrapping.

Whereas: The large imports of substantially all products which can be transported over seas are conclusive evidence that such products made abroad can be sold at a profit in the United States market paying present duties, and

Whereas: This fact should convince the unprejudiced that present duties are not excessive, therefore, be it

Resolved: That in behalf of the owners of the sources of production and of all producers in the United States, we urge such rates of tariff at our customs' houses as shall prevent increased importation of competing foreign products.

Resolved: That the president appoint a committee of five to take immediate steps for the establishment by this Association of uniform, standard conditions under which tests shall be made on cotton cloth and cotton yarn, and the establishment of a public conditioning house under the control of the Association where tests can be made under the conditions so adopted. This committee to draw up rules and prices for such conditioning house on the same general lines as those of the Manchester Chamber of Commerce. The committee to have full power to go ahead in this work after submitting their plans to the Board of Government and obtaining their approval.

Whereas the Association favors the suggestion that a national council or committee be formed to unite the cotton manufacturing industry of the United States on matters of general importance.

Resolved: That the President of this Association appoint a committee of three of which he shall be one to confer with a similar committee from the American Association of Cotton Manufactur-

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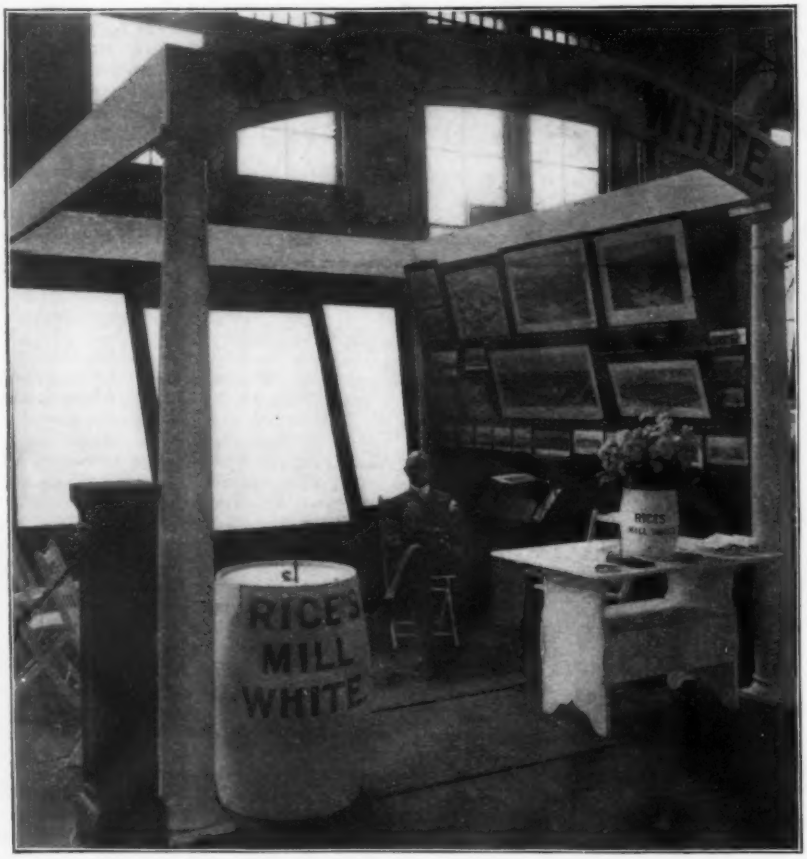

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Resolved: That the Board of Government of this Association express their desire that the cotton planters of Imperial Valley, Cal., shall devote themselves to the cultivation of American long staple cotton, which should give them a higher remuneration than any other cotton, and that they refrain from planting the short staple American Upland cotton and destroy the seed, in order to prevent the deterioration of the long staple cotton by hybridization.

Resolved: That the California cotton planters be requested to pack their cotton bales with covering similar in character to the Egyptian cotton with its closer woven wrapping.

Whereas: The large imports of substantially all products which can be transported over seas are conclusive evidence that such products made abroad can be sold at a profit in the United States market paying present duties, and

Whereas: This fact should convince the unprejudiced that present duties are not excessive, therefore, be it

Resolved: That in behalf of the owners of the sources of production and of all producers in the United States, we urge such rates of tariff at our customs' houses as shall prevent increased importation of competing foreign products.

Resolved: That the president appoint a committee of five to take immediate steps for the establishment by this Association of uniform, standard conditions under which tests shall be made on cotton cloth and cotton yarn, and the establishment of a public conditioning house under the control of the Association where tests can be made under the conditions so adopted. This committee to draw up rules and prices for such conditioning house on the same general lines as those of the Manchester Chamber of Commerce. The committee to have full power to go ahead in this work after submitting their plans to the Board of Government and obtaining their approval.

Whereas the Association favors the suggestion that a national council or committee be formed to unite the cotton manufacturing industry of the United States on matters of general importance.

Resolved: That the President of this Association appoint a committee of three of which he shall be one to confer with a similar committee from the American Association of Cotton Manufactur-

ers in relation to the formation of such a body and to report in print their recommendation to this Association at its next meeting, and further resolved that in the meantime all matters of general importance be referred to this committee.

The election of new members resulted as follows:

FOR ACTIVE MEMBERSHIP

Herman H. Bachmann, Lowell Textile School, 28 Fifth Ave., Lowell, Mass.

Dr. Matthew S. Borden, American Printing Co., 90 Worth St., New York.

Henry W. Buhler, of Buhler & Emerson Conditioning Laboratory, 251 Causeway St., Boston, Mass.

Stuart W. Cramer, Pres. Mayes Mfg. Co., Charlotte, N. C.

James Leroy Harring, Supt. Bennett Mills, New Bedford, Mass.

John C. Hebden, V. P. & Gen. Man. Franklin Process Co., 291 Promenade St., Providence, R. I.

F. C. Holmes, Treas. & Mgr. Plymouth Cordage Co., North Plymouth, Mass.

Arthur C. Homer, Treas. Pilgrim Mills, 124 Barnaby St., Fall River, Mass.

George I. Macy, Supt. Soule Mill, New Bedford, Mass.

E. N. Murti, Cotton Manufacturer, Mandapaka, Tanuku Tahu, Kristna St., Madras, India.

After election Mr. Murti will become a life member.

Isaac T. Prosser, Supt. Harmony Mills, 67 Johnston Ave., Cohoes, N. Y.

Charles O. Richardson, Treas. Warwick Mills, 49 Federal St., Boston, Mass.

George Smedden, Agt. Grinnell Mfg. Corporation, New Bedford, Mass.

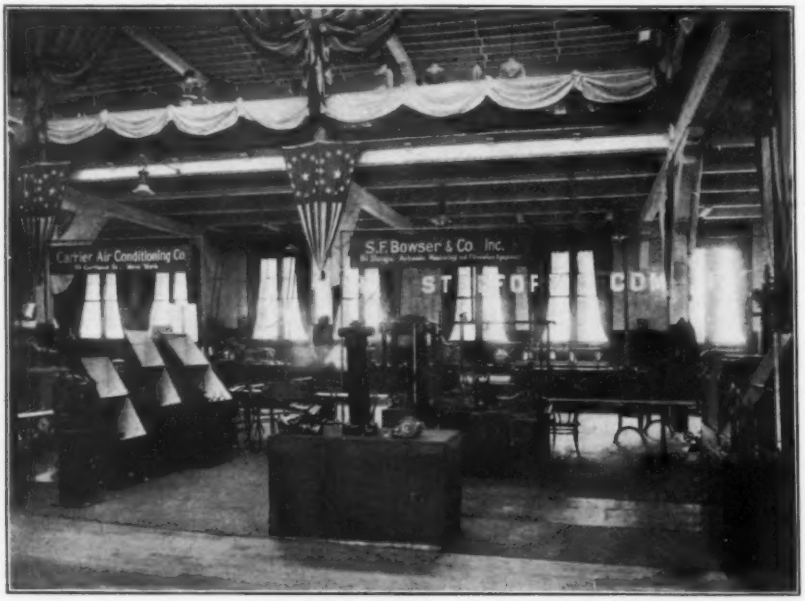
Malcolm B. Stone, Treas. Ludlow Mfg. Associates, 111 Devonshire St., Boston, Mass.

Philip M. Tucker, Banker, Pres. Boston Machinery Co., 24 Milk St., Boston, Mass.

Robert F. Wallace, Asst. to Gen. Man., Fitchburg Yarn Co., Fitchburg, Mass.

William J. Wilson, Supt. Oxford Linen Mills, North Brookfield, Mass.

Charles William Young, Supt. N. E. Cotton Yarn Co., 170 Middleboro Ave., East Taunton, Mass.



THE S. F. BOWSER & COMPANY, INC. EXHIBIT.

FOR ASSOCIATE MEMBERSHIP

George A. Cutter, Mgr. Cell Drier Machine Co., Taunton, Mass.

Rogers W. Davis, Agt. Kitson Machine Shop, Lowell, Mass.

Percy Kenyon, Chapel Field Works, Dukinfield, England.

Fred S. Klebart, Field Mgr. J. B. Ford Co., 47 Mt. Bowdoin Terrace, Boston, Mass.

Jonathan Thayer Lincoln, Kilburn & Lincoln, Loom Mfrs., Fall River, Mass.

Charles M. Mumford, Chief Assistant on Textile Work, Lockwood, Greene & Co., 17 Stearns St., Newton Centre, Mass.

J. Henry Thorpe, Sales Agt. U. S. Bobbin and Shuttle Co., 236 Butler Exchange, Providence, R. I.

Malcolm D. Whitman, of William Whitman & Co., 350 Broadway, New York, N. Y.

The Machinery Exhibition

The Textile Machinery Exhibition of 1912 demonstrated in an even greater degree than was the case in 1910, the growing interest in this institution. It is of value to the mill owner, the overseer, and general public, as well as to the exhibitors. No amount of written matter or oral explanation can take the place of an actual inspection of the machine or article that is offered for sale, and so it is, that a visitor to the textile machinery exhibition can in a few hours inspect machinery, processes, and mill supplies, which would require an untold amount of time and labor to investigate at the business places of the exhibitors.

THE DRAPER COMPANY.

The entire floor space in the main hall of Mechanics Building in Boston was occupied by the textile machinery exhibition proper. Practically all of the gallery was also sold, and in the last few weeks there were many disappointed exhibitors, some of whom wanted more room, and others who were unable to get any room at all, so great was the demand for space. The basement was given over to the power show. The experience of preceding years has enabled the management to conduct the exhibition so as to afford the greatest convenience to the public and to the exhibitors, and under the skilled management of Chester I. Campbell the whole show ran like clock work. The hall was tastefully decorated with bunting and the exhibitors carried out the decoration of their own individual spaces in harmony with the general plan, so that the whole effect was pleasing, without being too confused or ornate. There was more aisle space for the convenience of the public, and on several afternoons and evenings it was all needed by the big throng of visitors. The Convention days, Wednesday and Thursday, naturally brought out the largest number of prominent mill men. The machinery was stopped while the sessions of the Convention were being held. It has been suggested that in future years when the Exhibition and the Convention are held at the same time it might be advisable to confine the sessions of

the Convention to the morning hours as is done by the American Cotton Manufacturers' Association, thus leaving the afternoon free for the manufacturers to visit the Exhibition. In the early days of the Association when there were no practical demonstrations of machinery nor so many technical articles presented through the columns of the trade press, the meetings of the Association with their practical papers presented afforded almost the only opportunity for interchange of ideas by manufacturers, but with the changed condition it might be well to shorten the technical program, which would probably insure a larger attendance at the Convention meetings. The Textile Exhibitors' Association, under whose auspices this exhibition was held, deserves the congratulations of the trade at the success attending this meeting. The executive committee has worked hard to insure its success, and it must have been a great satisfaction to them to hear the many words of praise from visitors and exhibitors. The exhibition proved a great success from the standpoint of the exhibitors, most of whom reported very satisfactory orders and good prospects developed during the week. The Association is in a flourishing condition financially, and the increased success which has attended each successive exhibition gives the assurance that there is no longer any doubt as to the continuance of these exhibitions either as annual or as biennial events as conditions may warrant. The officers and executive committee of the Association are: President, F. H. Bishop; Vice-President, H. W. Butterworth, and F. B. Comins, M. H. Merrill, Lewis F. Tracey, E. F. Hathaway; Secretary and Treasurer, Chester I. Campbell.

CROMPTON & KNOWLES LOOM WORKS.

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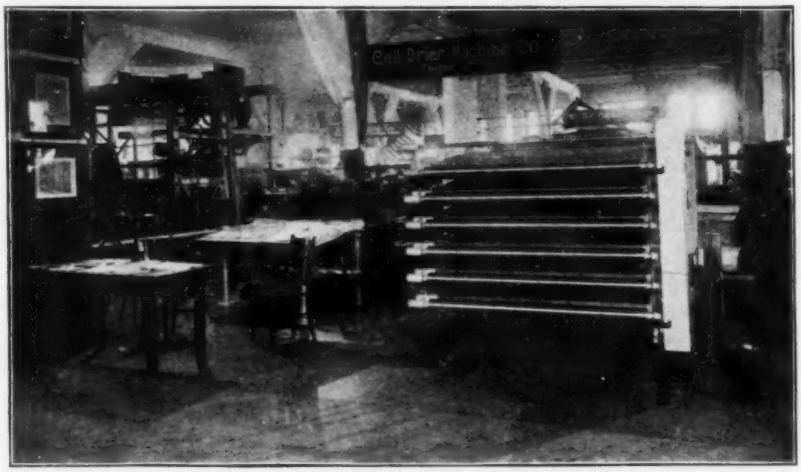
The Draper Company occupied four large spaces in the center of the main floor and visitors were able to see many of the products which have been invented and developed by the wonderful mechanical genius embodied in this organization. Four models of the famous Northrop loom were operated, one of which was the new M model especially built for fine work, on which every gear is a cut gear and in fact every part made and assembled as carefully as if the finished machine were an automobile. It is representative of the new era of making a loom

in the machine shop instead of in the foundry. This new model loom was weaving a standard New Bedford lawn using 80s warp and 120s filling. The other looms were a broad sheeting loom, 90-inch reed space, weaving a Pequot sheeting from 22s warp and filling; a narrow loom weaving pillow tubing and equipped with the Dwight spring top for harness motion; and a regular 40-inch sateen loom weaving a filling sateen, 64 threads and 112 picks.

Three warpers were exhibited; one fine goods model F warper, which measures from



THE CELL DRIER MACHINE COMPANY.

the cylinder and is especially adapted for 100s yarn and finer; a model G warper with balling machine attachment; and one large warper designed for coarse work such as ducks. The latest improved model I spooler with lifter rod eliminated and with conveyor for taking care of bobbins, also a twister with tape bands, four spindles banded together, insuring uniform spindle speed, received much attention from manufacturers.

A practical demonstration was given of their automatic yarn tester for testing single yarns and recording automatically on a chart the breaking strength of each thread in ounces which provided the opportunity for many to see the value of this device. Other features noted were Morrill's Patent Slasher Comb which was recently brought out to prevent "slasher rolls" on warps; Duckworth's Patent Traveller Magazine, Mirror Spinning Rings; Northrop Loom Bobbins; Rabbeth Spindles and Dutcher Temples.

The Crompton & Knowles Loom Works featured their automatic looms running with two to four colors, changing automatically only such colors as are desired, and only when required. These looms will keep in practically continuous operation weaving goods of two or more colors, automatically changing just before the exhaustion of the filling, and supplanting the depleted bobbin with a filled one of the same color. The various inventions employed in these looms are so devised and constructed that the selecting from the magazine of other than the proper color is impossible. A blanket loom was running 115 picks a minute with three colors, with a jacquard controlling the pattern, weaving a figured blanket, and presenting to manufacturers a practical illustration of the wide range to which the automatic loom may be diverted outside of plain and gingham fabrics. Two other looms were operated at a speed of 155 picks per minute, one on two and the other on four colors. All the looms were equipped with Crompton & Knowles Warp Stop Motions which are adapted for either plain or fancy weaving.

In the construction of the automatic loom the warp stop motion, whether operated mechanically or electrically, is one of the essentially requisite features.

The Stafford Company gave a most comprehensive exhibition of modern weaving machinery. It occupied the whole of the Southwestern Side of the main part of the hall, was most attractively arranged and decorated and was always surrounded by a throng of visitors. It comprised ten "Ideal" automatic looms and one silk loom, weaving cloth ranging from heavy ducks and bags to silk and fine fancy cottons and including worsted dress goods, Terry cloth and jacquard figured fabrics. As the visitor approached, the first loom observed turning out its dainty product was a standard Stafford silk loom equipped with a twenty harness dobby making printed taffeta, 36 inches wide, 6,000 ends in the warp and 100 picks to the inch. The next was an automatic cotton loom with a 70s warp and 60s silk filling running 145 picks per minute, the silk filling being wound on paper tubes by the Universal system. This was followed by the new 1912 model, which has embodied in it the very latest ideas in loom design and construction, and was making a standard sheeting using cop and bobbin filling alternately in the same magazine. A fine voile loom showed the usefulness of automatic looms on goods of this variety, weaving a beautiful voile of 100/2 warp and 100/2 filling, 64 by 60. A special type of "Ideal" automatic loom for making bags was next and made the bags complete on the loom, both sides and bottom being woven in.

THE STAFFORD COMPANY.

The sixth showed another new use for automatic looms, the making of Terry towels. The top warp was 20/2 and the bottom warp 30/2, the filling being beaten up at a speed of 150 picks per minute. On account of the unusual nature of this weave the loom received a great deal of attention from practical mill men who were much interested in seeing such goods made on an automatic loom. A broad sheeting loom was next,

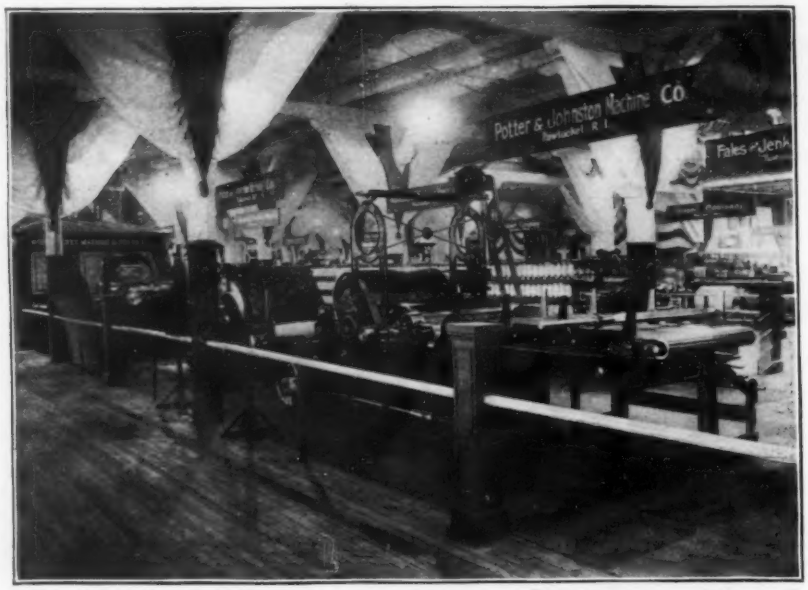
weaving a piece of standard 90-inch sheeting, running 103 picks per minute. This loom is built with improved forms of take-up motion, picking motion and let-off. The eighth was a duck loom making 12-ounce duck, 30 inches wide. It weighed over 3,000 pounds and was speeded up to 145 picks a minute. A 63-inch worsted loom of the automatic type wove worsted dress goods on 4 harnesses and was followed by one weaving a three harness blue denim, equipped with a feeler motion and running 165 picks per minute. The splendid cover on these goods was especially noted. The last was a jacquard loom making a figured fabric with a plain warp and red filling and attracted especial attention on account of the unusual nature of the goods.

WHITIN MACHINE WORKS.

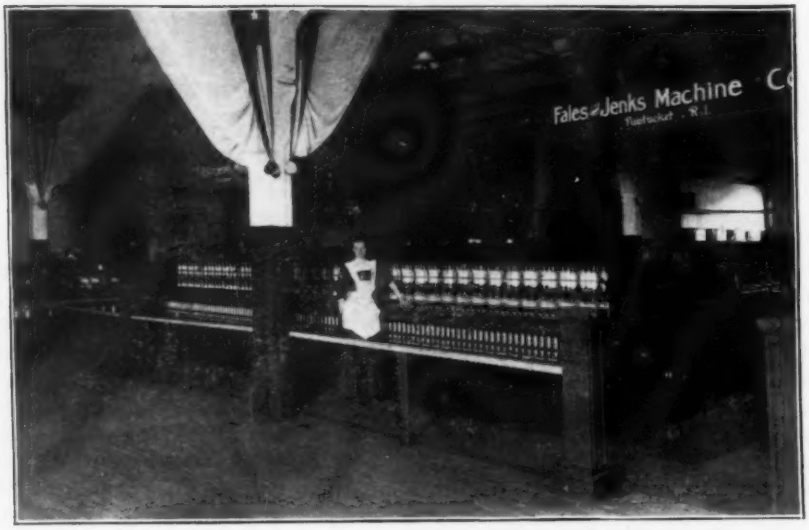
In a large space enclosed by a handsome nickeled railing finished by the same process that the guides, tables and other bright parts of their products are nickeled, the Whitin Machine Works, Whitinsville, Mass., exhibited a roving frame, drawing frame and fancy loom in full operation. The roving frame was the Whitin-Providence type which needs no introduction to mill men as its continued use and popularity in hundreds of mills is a sufficient testimonial of the high reputation it enjoys. A novel demonstrating model of bolster rail, flyers, roller beam and top cone was used to explain the features. It should be mentioned that this self balanced rail roving frame was said to be the longest 6 by 3 roving frame known to have been operated on 20-hank roving at a rate of speed to equal a smaller size from the minimum of staple with the maximum draft and ordinary speed. They were directing the attention of the trade to the possible economies in the use of longer roving frames on the finer hanks. The drawing frame was the Whitin new pattern type equipped with metallic rollers, ermen clearers, lifting rolls, double action trumpets, self-locking covers and many other improvements. The durability and simplicity of the machine made it a subject of favorable comment among manufacturers. In one corner of the space, a Whitin 36-inch

fancy loom, equipped with 20 harness double index Whitin dobby, warp stop motion, half and return motion and slackener motion

vidual motor and is an exact duplicate of thousands that have been built for New Bedford mills and other fine goods centers.



POTTER & JOHNSTON MACHINE CO.

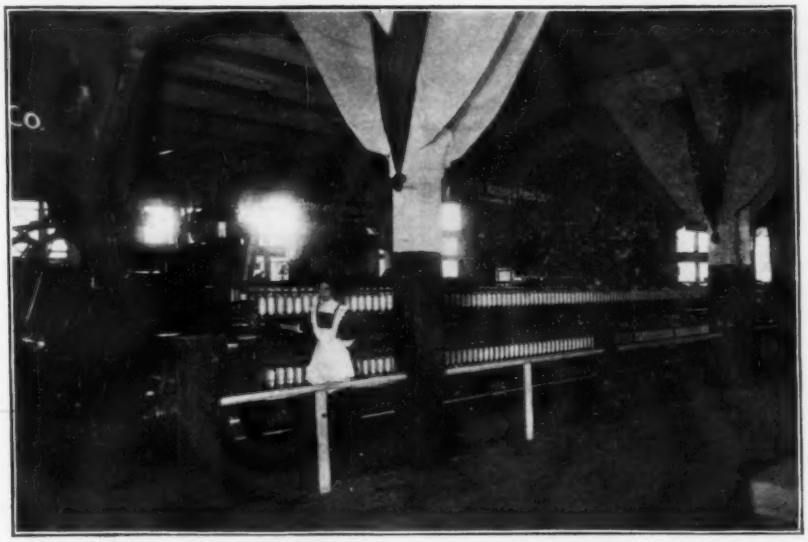


FALES & JENKS MACHINE CO.

complete was weaving a very intricate leno pattern of high grade dress goods from three beams. The loom was driven by an indi-

The affiliated companies, Potter & Johnson Machine Co., Woonsocket Machine & Press Co., Fales & Jenks Machine Co. and

the Easton & Burnham Machine Co. had a complete exhibit of machinery for converting raw cotton into yarns, and winding warp yarn on spools ready for the warper. It was instructive to the manufacturer on account of the many new features brought out, and to the non-technical visitor on account of showing the wonderful processes by which the



WOONSOCKET MACHINE & PRESS CO.

EASTON & BURNHAM CO.

cotton fiber is converted quickly and economically into yarns for weaving and knitting.

The first machine was a Potter & Johnson one-beater breaker with double hopper feed regulator. The bale is put on the breaker and feeds automatically into the hopper box. It insures a regular feed on the hopper apron giving a more uniform lap and combining the work of separate bale breakers and openers. The next machine was a Potter & Johnston single beater finisher taking four laps from the beater breaker and making a finished lap for the card. This was equipped with patent differential motion for evening, doing away with the old fashioned clutch gears. A new Potter & Johnson revolving flat card took the laps from the finisher and turned out the sliver for the drawing machine. It should be mentioned that this card combines many new features, including a gear driven comb box, self-adjusting feed roll, which can be adapted for both long and short staple, differential motion for driving flats, heavy steel shafts in cylinder and doffer, set in self-aligning bearings, with oil rings, etc. The drawing frame was a 4-delivery head, taking six cans from the card and drawing into a single sliver. Some of the features brought out were the simplicity and durability of the machine. It was equipped with self threading lifting roll, a fine pitch calender roll gear, giving the fine changes so often necessary and which are impossible with coarse pitch gears, top rolls equipped with Campbell ball bearings, mechanical stop motion and a method of gearing up the steel rolls which in combination with the sliver guide gives accurate draft and eliminates the double change often necessary on some forms of gearing.

H. W. BUTTERWORTH & SONS CO.

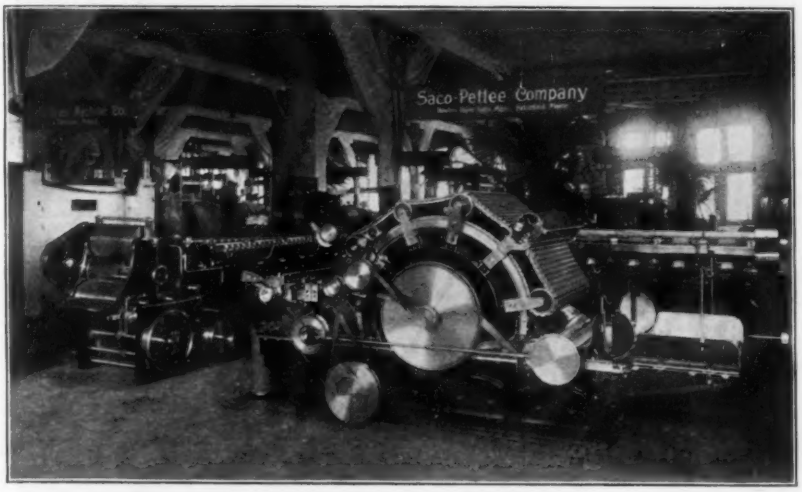
A Woonsocket Machine & Press roving frame of 200 spindles carried on the operation of reducing and evening the slivers. It was equipped with Campbell ball bearing rolls, noiseless chain drive, which does away with vertical and angle shafts, the Daly compound or differential motion for reducing speed of the bobbin, new model hank clock for indicating production of the frame, center lift for preventing the hesitation of the bobbin rail present on the head end drive, drop

front creel to make creeling more accessible to operatives, patent contact gearing for getting fine adjustment of the tension, and many other important improvements.

A Fales & Jenks spinning frame of 224 spindles then took the roving completing the operation of yarn manufacture. It was driven by a cloth pinion drive from motor to cylinder shaft. This frame had a Fales & Jenks metal thread board, metal top clearer and special metal creel adjustable for roving.

room for their many friends and customers. Photographs of the machinery decorated the walls, flowers were abundant and the space was attractively furnished as a resting place. Harry W. Butterworth, the President of the Company, was on hand to greet his many friends, assisted by members of their New England staff.

The Saco-Pettee Company, Newton Upper Falls, Mass., showed a new waste card which



THE SACO-PETTEE COMPANY.

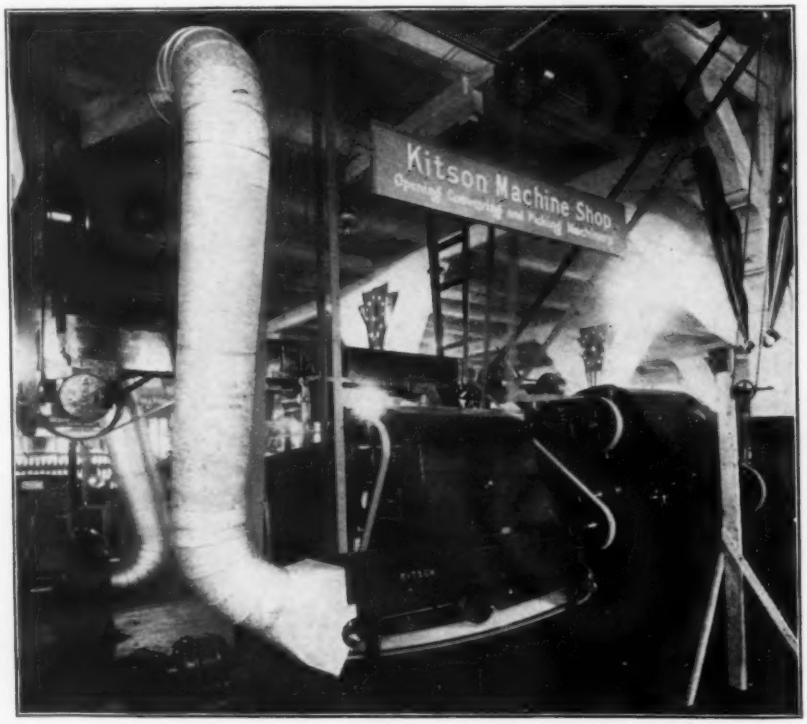
This combination of metal creel, top clearer and thread board greatly reduces the danger from fire and entirely eliminates the troubles due to the warping of wood. The spindles were driven by the Fales & Jenks type of tape drive, 4 spindles, two on each side, being banded together.

The Easton & Burnham Machine Co.'s exhibit was separate from the yarn making machinery of the other concerns and included a spooler of 80-spindles, working on 30s yarn from spinning frame bobbins on spools for the warper. A quick changing motion capable of changing from 3-inch to 7-inch traverse without stopping the spooler was demonstrated, also a bobbin conveyer which lightens the work of the operative.

H. W. Butterworth & Sons Co., of Philadelphia, occupied their space as a reception

could be used for either single or double carding. The utilization of waste is receiving vastly more attention from cotton manufacturers than ever before and the interest shown in this card was very noticeable. Millions of pounds of cotton waste from our American mills are exported to Europe and manufactured into cheap but serviceable goods of various kinds, many of which doubtless find their way back again to this country. These goods should and can be made in this country. The Saco-Pettee Company has developed this card along the lines of the best foreign practice to card all sorts of cotton mill waste. The product of this card goes direct to the slubbers, eliminating the processes of drawing. They also showed their latest model drawing frame and new type of lap winder.

An interesting exhibit was given in spaces 63-65 by the Kitson Machine Shop of Lowell, showing bale breakers and methods of conveying cotton from the storehouse to the picker room or mixing bins. The first machine shown was a bale breaker for taking care of up to 40,000 pounds of stock a day. It delivered into a conveying pipe, carrying the cotton from the opening room in the warehouse to a distributing system in the picker room. The distributing system is arranged for automatically delivering the cotton to the breaker picker, but can also be built to deliver to bins in mills that use various kinds of stock. Another bale breaker was shown for a mixing system. Machines of this latter type handle about 7,000 pounds of cotton per day and feed to a lattice mixing table, delivering to a conveying pipe as in the first case. With this system a mill is enabled thoroughly to mix or blend its various grades of stock and get absolutely uniform mixings. For the purpose of changing the speed of the bale breakers to deliver the proper quantity of cotton into the picker room, a variable speed drive was used, which proves very useful for this purpose. Attention was called to their complete line of pickers and lappers of all the standard patterns, also an extensive line of machinery for reclaiming cotton waste, including thread extractors, roving waste openers, card and picker waste cleaners, card waste machines for tearing up hard yarn waste and knit and duck clippings. A specialty has been made of conveying systems for handling waste stocks.

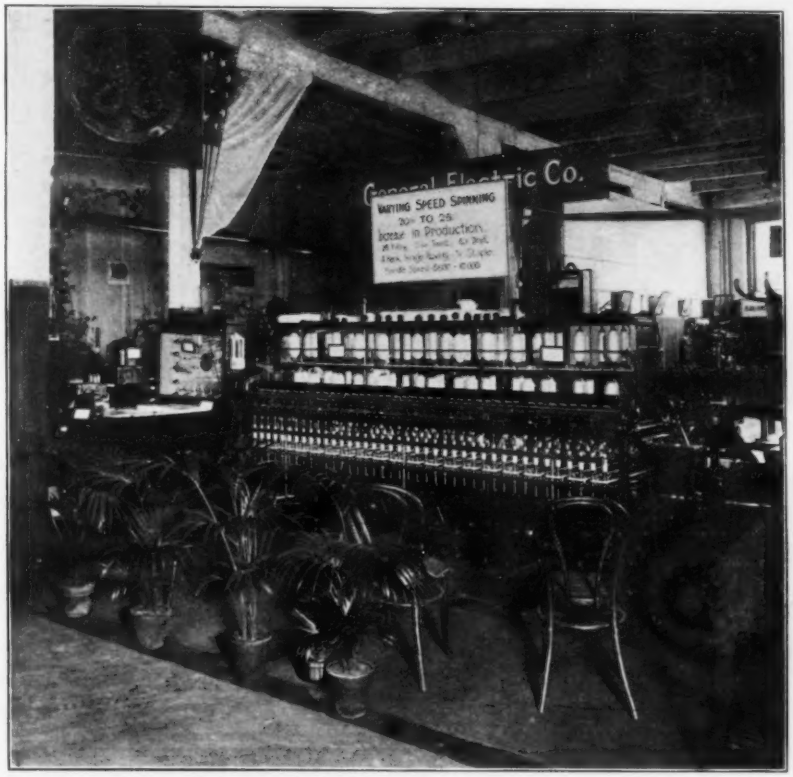


KITSON MACHINE SHOP.

One of the most important new things in the Show was exhibited by the General Electric Company. This feature was a Fales & Jenks tape driven ring frame operated by the new General Electric variable speed motor and regulated by a controlling device specially designed for this purpose. There have

been mechanical devices employed in Europe for varying the speed of the wind at different stages of building the cop, but never before has this been accomplished with an electric motor drive, and it attracted a great deal of attention. Sidney B. Paine, the manager of the company's Mill Power Department, has been working on this for a number of years, driven at constant speed. This frame was running on speed varying from 6,800 to about 10,000 turns, while if operated at constant speed it would be about 7,500. The motor when perfected can be attached to the main shaft of any make of frame.

Another interesting exhibit was a color matching device, which absolutely matches



THE GENERAL ELECTRIC CO.

and the result has been so satisfactory that even although it is not quite ready for the market it was determined to exhibit at this Exhibition. The frame was spinning 26s yarn with filling wind from 4 hank single roving. The motor speed automatically varies with the varying speed of the front roll delivery so that both the front roll and spindle speed harmonize, and the yarn is kept at constant tension during the entire building of the cop. The average front roll speed is higher than is possible on frames

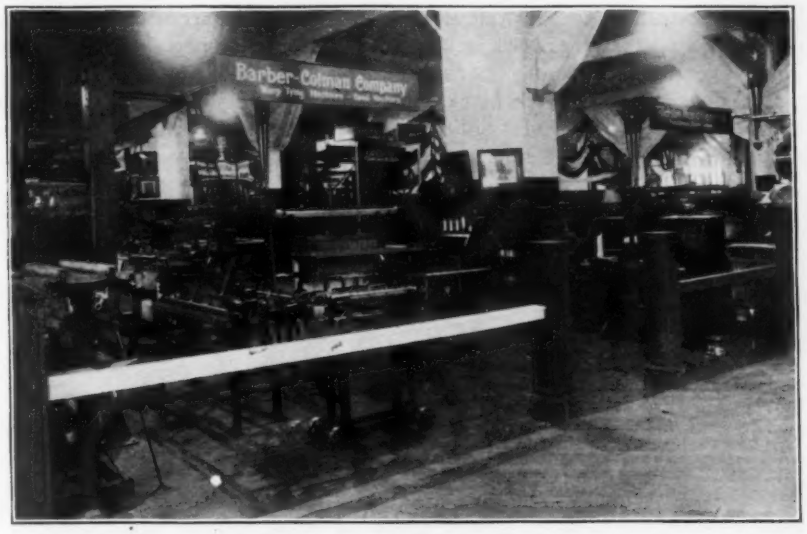
daylight, for use in dye houses, bleacheries and all places where it is necessary to match colors accurately. Other devices displayed were new types of oil break switches, cotton cloth pinion gears which are extremely strong and quiet, many of the looms in the Exhibition being equipped with them, also complete line of incandescent lamps and an ozonator for purifying air, particularly in rooms where large numbers of hands are employed.

Thomas Leyland & Co., 60 India St., Boston, Mass., were in a busy section of the Exhibition, and had an ample space in which the line of Mycock's specialties for bleacheries and finishing establishments was well displayed. The Mycock patented cloth expander was shown in several different models adapted for different classes of work. An unusually wide stretcher or expander for quilts with center support attachment was an

THOMAS LEYLAND CO.

ALFRED SUTER'S EXHIBIT.

interesting machine. Other features of their exhibit included a scutcher with a solid brass scroll, the worm and scroll being combined, all bearings self-setting and interchangeable; a 3 Bar calendar stretcher; a 5 Bar water mangle expander; piece sewing machines; whaleback sewing machines. Col. F. T. Walsh, the manager of the company, was present during the week with several assistants.

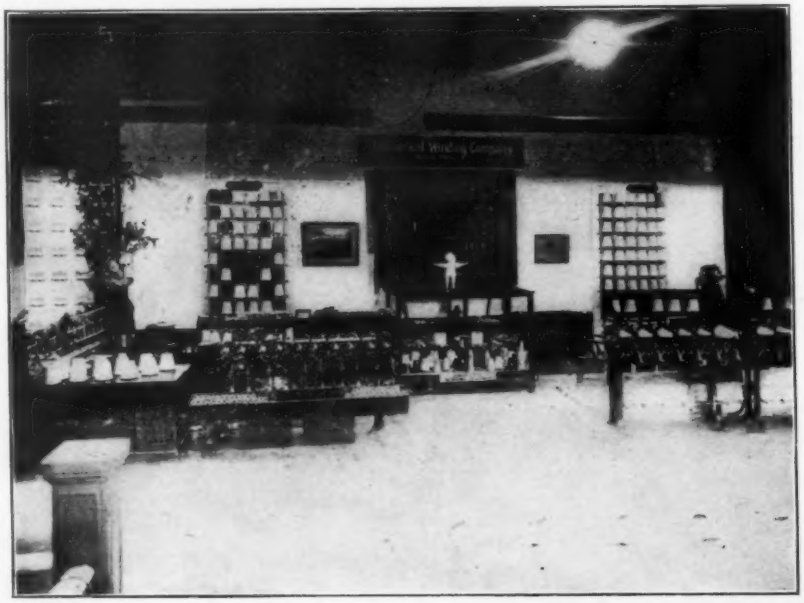


BARBER-COLMAN-COMPANY.

STUART W. CRAMER'S EXHIBIT.

Alfred Suter's Exhibit at booth 331 comprised a full set of yarn and cloth testing instruments such as the new electric conditioning oven with fan attachment; an automatic

strength and elasticity tester with oil controlled pull; a yarn reel; twist testers with take-up, registering device and magnifying glass; universal yarn and cloth analyzing set combined with tables showing the weight of yarn or cloth in drams and ounces in any width; a yarn evenness inspecting machine with aluminum board covered with black or white velvet. Mr. Suter also showed the schappe yarns of J. Villards Co., of Lyons, France. Besides these, Mr. Suter had on exhibition a small Permutit water softening apparatus and a reed-entering machine.



THE UNIVERSAL WINDING COMPANY.

The exhibit of the Universal Winding Co., 95 South St., Boston, attracted the attention of every passerby, not only because of the machinery in operation, but on account of the bright and pleasing display of yarn packages of various fibers in striking colors tastefully arranged. The machines shown in this exhibit were operating under actual mill conditions. They were not merely show machines. The No. 90 bobbin winder was operating on No. 18 yarn furnished by the Farwell Mills, and the rewound filling bobbins were returned to the mill to be used in their regular mill work. The No. 50 "Nutaper" cone winder was running on No. 26 bleached yarn supplied by the Nyanza Mills which was being wound for them. The machines were installed in the front of the space where their operation and special features could be easily seen by the visitors. The wall space was utilized by a display of samples of the work of the Universal machines, and a model of the "Nutaper" boy was on top of the center show case. Frederick H. Bishop, the secretary of the company, who is also president of the Textile Exhibitors' Association, and Robert A. Leeson, the treasurer, and other members of their staff were on hand during the week. We understand that several substantial orders were booked. Mr. Bishop received many congratulations from his brother exhibitors, not only upon their own exhibit but at the success of the show, and the fairness with which the many problems of the Exhibition had been settled.

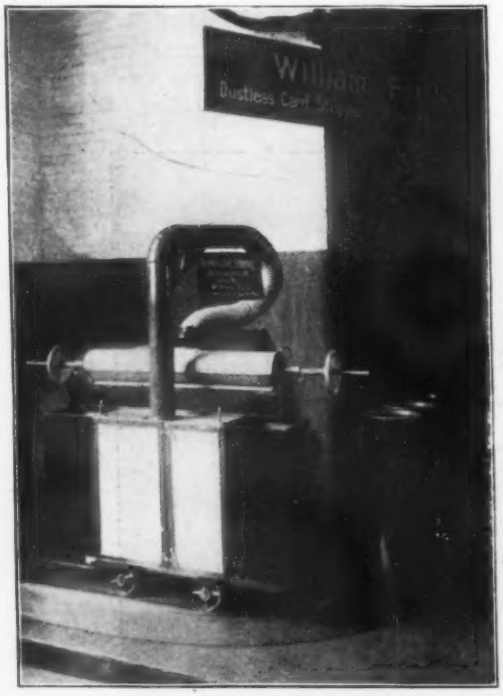
The Bassett Machine Works of East Milton, Mass., showed a large power tester adapted either for yarn or cloth. It was a very finely built machine, and would test up to 600 pounds.

Barber-Colman Company, Rockford, Ill., had in operation a Model E Barber Warp Tying Machine with a capacity of 9,000 to 11,000 ends per hour, and a smaller portable machine known as Model K with a capacity of 3,000 to 4,000 ends per hour, especially designed for Jacquard looms. The wonderful mechanism held the close interest of hundreds of visitors as it selected threads and tied thousands of knots. These machines are adapted for any number and kind of harnesses, and drop wires, or even for jacquard work, and over 450 machines are in use in this country and abroad on cotton and worsted work. Barber-Colman Company also showed four styles of hand knotters for use in cotton, worsted and knitting mills, and a new hand knotter for use in silk mills.

HESS-BRIGHT MANUFACTURING CO.

When one stopped in front of the big display of the Hess-Bright Mfg. Co. of Philadelphia, and saw all the different machines running by small "belts" of twine, it was a forceful demonstration of the minimum of friction which the Hess-Bright ball bearings render possible. This was further emphasized when he learned that the whole exhibition was run with 6/10 kilowatts power, or less than one horse power. The space was attractively laid out, on the back wall being a great display of different styles of ball bearings, one case containing 877 bearings of all kinds. On the posts and sides were photographs showing installations in all lines of industry. One that attracted particular attention from mill men was an inside view of the Amazon Mills controlled by the Cannon interests, which are using the Hess-Bright ball bearings on the line shafts. Different styles of hangers were shown under a running test. Shafting mounted on Hess-Bright bearings carrying 1,000 pound load of iron could easily be turned with the thumb and finger. The machinery which was running by the twine drive comprised a face grinder; a buffing machine; an upright drill; a jointer. J. S. Kunkle, the head of the Hanger Department of the company was in charge of the exhibit, assisted by C. S. Marden, New England Agent, and several associates. They certainly gave a striking demonstration to the visiting textile men.

Stuart W. Cramer, Charlotte, New York and Boston showed his air conditioning apparatus. An efficient and adequate humidifying system is now considered an essential part of practically every textile mill and the question for manufacturers to decide is

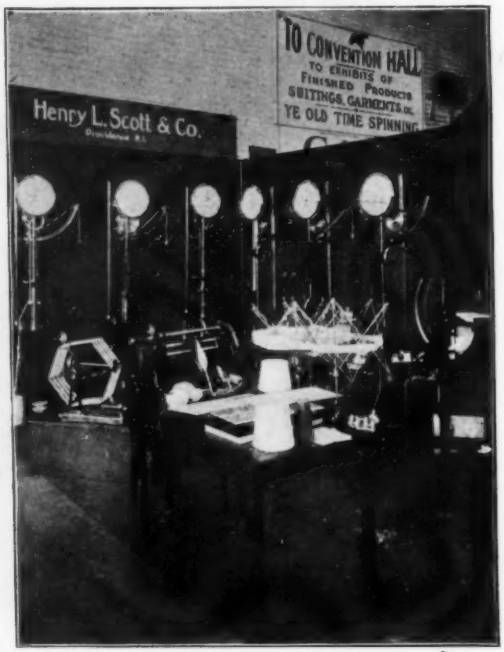


WILLIAM FIRTH'S EXHIBIT.

which system is best suited to their particular requirements. It is frequently desired to heat in winter, cool in summer and humidify the year round with one central system. Recognizing the wide variety of requirements it has been the aim of Mr. Cramer to develop apparatus suited to various conditions.

A representative display was made including atomizer heads, spray heads, individual air conditioners, central station air-conditioners, automatic humidity and temperature regulating system. They exhibited for the first time a new regulator that not only indicates and actuates the systems, but records temperatures and regain in the fiber throughout the different processes of manufacture. It can be applied to any existing system of any make without discarding any part already installed. An interesting feature was a series of charts giving weekly records for maintained conditions of humidity and temperature from their equipment in the plant of Cheney Bros., South Manchester, Conn.

William Firth, John Hancock Bldg., Boston, exhibited a patent Can Tramway, a novel system providing efficiency, convenience and economy in transporting roving cans from one part of a mill to another and in placing and removing cans in relation to the various process machines such as cards, lappers, combers, drawing frames, etc. This was illustrated and described at length in the April issue of the "Textile World Record." This system has been in constant use for two years in large cotton mills and has thoroughly demonstrated its practicability, usefulness and economy in saving waste, time and labor. A dustless card stripping appa-



HENRY L. SCOTT & CO.

ratus for improving card room conditions also was shown ready for use. One of these machines was in use for stripping the cards in the Potter & Johnson Co.'s exhibit. This is a portable apparatus, self contained, and the method of operating is the same as the usual method of stripping with the ordinary stripping roll. All neps and dust are taken directly from the stripping roll through a flexible tube by suction created by a fan in the machine and deposited in a dust receiver, eliminating the usual dust, sand and grit which settle on the machinery and are taken into the lungs of the operatives. The apparatus makes it possible to operate the carding, drawing, combing and roving machinery in the same room without injury to the work usually caused by the excessive dust while stripping.

Henry L. Scott & Company of Providence, R. I., displayed a line of testing machines. Two of them, motor driven strength testers, were shown in operation. One of these, a cloth testing machine, was particularly interesting to many people, and as this was the first time their machine had been exhibited, it received a great deal of attention. The usual amount of interest was shown in the yarn strength testers, and several orders for both hand and power operating machines were taken. The twist counters, scales, yarn inspectors, roving and yarn reels and other machines received a good share of attention. The general effect of the display was particularly pleasing, and the location at foot of the stairs leading to Convention Hall was good. The company reports a highly successful week in all respects.

FOSTER MACHINE CO.

The Foster Machine Co., Westfield, Mass., makers of cone and tube winding machinery, showed in their space on the main aisle two demonstrating machines which were operating on five classes of work. A cone winder was winding 40s white and 2/60s blue mercerized cotton from cops and quills on cones. On the other side of the cone

winder worsted yarns were being wound on parallels ready for jack spooling, insuring a greatly increased production on the jack side on 2-fold French spun worsted, winding on parallels from bobbins and cops in preparation for twisting. This new machine at-

BIRCH BROS.

W. T. LANE & BRO.

spooler and better quality of work. The new Foster doubling winder was running on 4-fold cotton on one side and on the other tracted much attention. The new features of these devices were carefully explained to hundreds of visitors who heard many practi-

cal arguments why all ply yarns, both cotton and worsted, should be paralleled before twisting.

Birch Brothers, Somerville Machine Works, Somerville, Mass., had a large and attractive exhibit on the north aisle. Albert Birch, proprietor, and Sidney Birch, sales agent, were in attendance during the week. The most striking feature was the new Hoey patent silent tenter, which was exhibited for the first time. This has a regular straight-way motion, as well as the oscillating motion. The smoothness with which the machine runs was very generally marked by manufacturers. It is equipped with the Hoey patent vertical unmarkable tenter clips. A continuous system was in operation, beginning with the scutcher, which opened out the cloth the full width. This was set in front of the starch mangle on which was placed one of their improved angular guides, the cloth then passing on to the tenter. Other machines shown were the latest improved gray room sewing machine of the Rayer and Lincoln style; also two models of the "Coronation" piece end sewing machine, one on the American and the other on the English style stand. They also showed a cloth expander or stretcher.

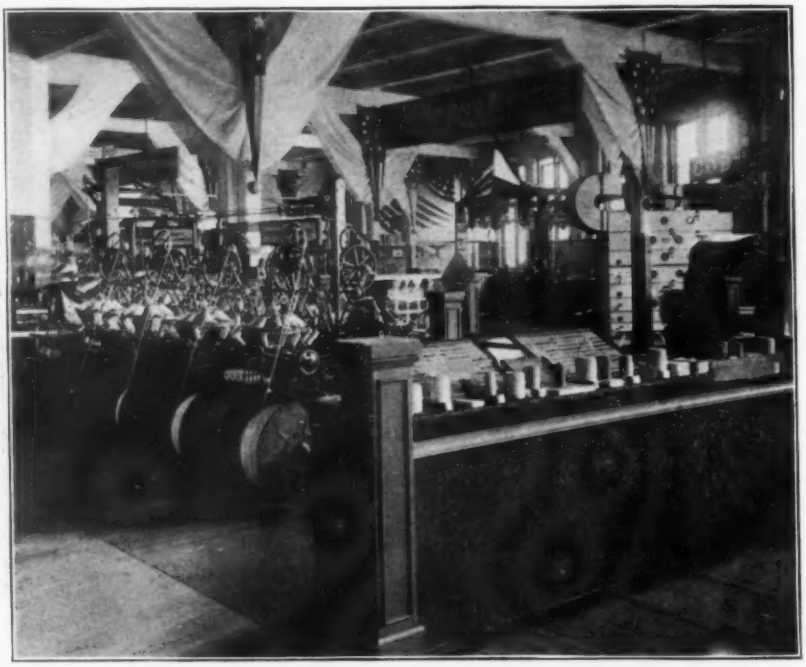
W. T. Lane & Bro., Poughkeepsie, N. Y., showed a line of canvas mill baskets in a variety of styles designed for every requirement of textile mill use. They are stanchly made with steel frame, and hard wood base and runners to stand the hardest kind of use. The firm has quite recently begun to manufacture their own duck so as to get exactly what they want. A new feature of construction on the baskets or trucks equipped with wheels, is an improved thread guard which overcomes the difficulty which is constantly met with with ordinary wheels becoming clogged with threads and lint. This thread guard absolutely prevents the thread from getting around the axles. Members of the firm were in attendance during the week.

THE BORNE, SCRYMSER CO.

The Borne, Scrymser Co. of New York and Boston, occupied a large space on the west aisle. It was arranged so that one portion was used as a display space for samples of their products, and another section partitioned off as a bower of roses and flowers, fitted for the comfort of their visitors. A desk, table and chairs furnished this little apartment. Special writing paper with the Convention letter head showed the attention to every detail carried out by Manager Bradley of the Boston office. Their line included

samples of the "Breton" brands of wool oils, the "Paragon" loom oils, and all varieties of spindle, lubricating, and other oils for mill use.

The Mossberg Wrench Co. of Central Falls, had an exhibit that was constantly surrounded by visitors who were attracted by the rapidly moving Wardwell Braiding Machines carrying brightly colored yarns braiding covered wire, twines, etc. A battery of eight of the new Wardwell braiders was shown, four of them covering electric wire, another running on what they call "Bankers' strong braid twist," and others on fancy lines, tinsels, fish lines, etc. The principle of this braider has been explained and illustrated in columns of this magazine. It permits operation at very high speed, and the use of packages of yarn which carry four or five times the amount of stock possible by the older principle of braiding.



THE MOSSBERG WRENCH CO. WARDWELL BRAIDER.

The American Moistening Company had a large and striking exhibit. The principal feature was a room fitted up with Comins sectional heads, regulated by the new automatic controlling apparatus recently developed by this company, by which the humidity of any room or rooms in the mill may be maintained at the desired point without personal attention. The apparatus was operating with a variation of 1/4 of a degree. The company has recently received figures from a plant where the new controller is in operation, showing remarkable closeness of regulation. For hours at a time the temperature and humidity readings do not vary. Another machine in operation was the fan type, specially designed for operating with the ordinary pressure of water in the mill; this is designed for places where a few heads are required or an isolated installation, where it would not be desirable to install the pressure system. Besides the above the folowing apparatus was shown: Comins type with trunk conditioning room apparatus; Comins centrifugal humidifier; jet atomizing humidifier;

air washing and humidifying apparatus; sprayer head for mines. A long list of their customers was shown, one striking feature being the names of fifteen concerns which have placed orders since the list was compiled for the Washington Convention six weeks ago. One corner of the space was fitted up as a reception room. Mr. Firth, the president, and Mr. Comins, the treasurer, with associate members of their staff were kept busy by a throng of visitors.

specialties including oil cabinets, oily waste boxes, comber waste boxes, oil drippers for shafting and engineer's feeders.

Cell Drier Machine Company, Taunton, Mass., showed a six cell drier 62 inches wide. At previous exhibitions this company has shown larger cell driers such as they build for bleacheries. The machines which they have exhibited have always been sold before the Exhibition closed, and this year proved

WE HAVE BEEN MANUFACTURING HUMIDIFIERS AND KINDRED DEVICES FOR MORE THAN TWENTY FOUR YEARS. BY MAKING HUMIDIFICATION OUR SPECIAL STUDY AND GIVING OUR WHOLE ATTENTION TO THIS ONE SUBJECT, WE HAVE PERFECTED OUR SYSTEM TO SUCH AN EXTENT THAT IT IS NOW RECOGNIZED AS STANDARD IN ALL TEXTILE CENTRES BOTH IN THIS COUNTRY AND ABROAD.
Automatic Humidity Control

THE AMERICAN MOISTENING COMPANY.

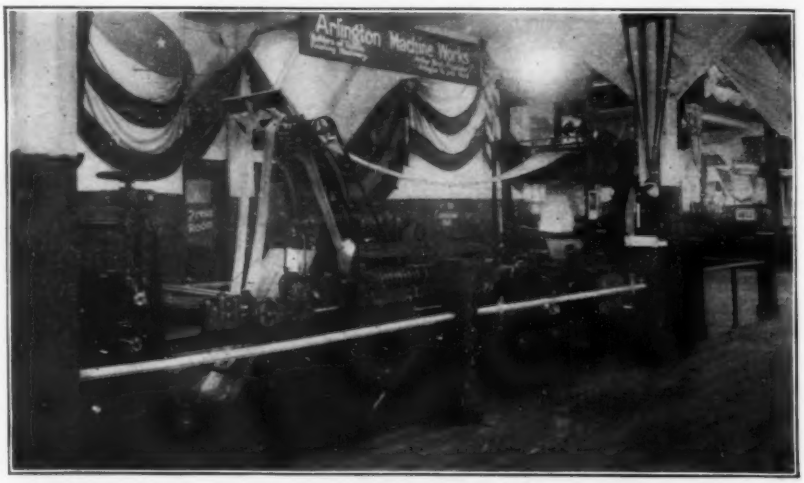
Stephen C. Lowe, Boston, agent for John Hetherington & Sons, Ltd., Manchester, England, exhibited a Hetherington patent self acting mule in operation, making 80s yarn for filling. This machine is the latest improved mule made by this concern. A Nasmith patent comber was also shown working on 1 1/4-inch Peeler furnished by the Grant Yarn Co. of Fitchburg. These combers have a high production at moderate speed without the sacrifice of quality and the overlap of the piercing obtained, which is about two inches, gives a stronger yarn. In connection with this exhibit the S. C. Lowe Supply Co., New Bedford, Mass., showed

no exception to the rule, the machine on exhibition having been sold to the Yale Woolen Company of Yale, Mich. Besides the six cell machine they showed a single cell in order to show the construction. John D. Street, who makes his headquarters at the Boston office, 147 Milk St., was in charge of the exhibition.

Walter A. Nivling, chief chemist of the Huron Milling Co., manufacturers of special textile starches, has recently been in the East devoting his time to additional research in the textile field in connection with the Industrial Starch Co., which is sole agent for the

Huron Milling Co. Mr. Nivling, who ranks among the foremost American starch chemists, was in attendance at the Textile Show, as was Leonard W. Cronkhite, treasurer of the Industrial Starch Co., who read a paper before the manufacturers' meeting on Wednesday. The Industrial Starch Company's business has grown very rapidly in the last few years on account of the special attention they have given to starch modified for textile purposes.

The Arlington Machine Works, Arlington Heights, Mass., had a large working exhibit showing a portion of their line of machinery for bleacheries and finishing establishments. The principal apparatus was a continuous system beginning with the squeezers, carrying the cloth through the opener, then through the mangle rolls, and then on to the folder, from which the goods would be delivered on trucks to the next process. They also showed two types of mill sewing machines; a gray room sewing machine; the "bell crank lever expander" for cloth; a pattern mangle; several styles of scrimp rails, which are made either in fiber, brass, or steel, according to different requirements.



THE ARLINGTON MACHINE WORKS.

The smooth running loom exhibited in the Whitin Machine Works attracted a great deal of attention. The warps on this loom were sized with Sizol, manufactured by the Seydel Mfg. Co. of Jersey City.

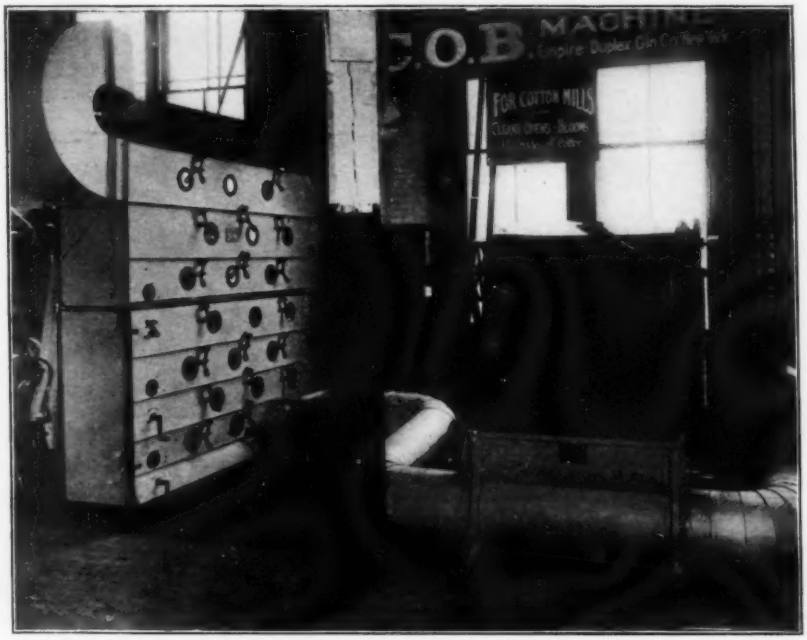
The American Warp-Drawing Machine Company of Boston showed one of their new style R. machines. There are many improvements in this machine enabling it to be used on a large variety of fancy work, as the pattern mechanism that controls the draught pattern is operated by feelers acting on a perforated steel or paper strip, thus avoiding the necessity of "giging up" pattern bars for complicated draughts. They are also exhibiting one of their 60-inch style M machines fitted with an attachment for picking the warp threads from a lease, thus enabling the mill to handle striped or colored goods with perfect accuracy. Included in their exhibit is one of their Axminster Carpet Tubing machines and attached thereto were a couple of photographs showing one of these little machines doing the work formerly requiring from twelve to fifteen.

Cork Insert Company, Boston, Mass., showed a full line of cork insert pulleys of steel with rims of cast iron; all types of frictions for looms and other classes of textile machinery, brake facings made for any kind of textile machinery, line shafting, clutches, speeder cones, cone facings, etc.

The High Speed Ring Company, Boston, Mass., C. S. Forbes in charge, had in operation a Saco-Pettee spinning frame equipped on one side with "High Speed" spinning

rings, and on the other side with the common rings. They were spinning 26s warps, running the front row at 164 turns per minute. We have described this invention in a previous issue.

The Empire Duplex Gin Company had a very interesting exhibit composed of one complete C. O. B. unit for cleaning, opening and glooming all grades and shapes of cotton fresh from the bale. This unit was composed of a Kitson feeder, doffer machine, fan, C. O. B. machine and condenser, practically demonstrating that the hardest compressed cotton could be opened, cleaned and aged without subjecting the cotton to heating in order to open. The company received several orders from cotton mills both North and South. The exhibition was in charge of Mr. Cheeseman.



THE EMPIRE DUPLEX GIN COMPANY.

G. M. Parks Co., Fitchburg, Mass., occupied more space than in the last Exhibition so that they could give a working demonstration of the new vacuum cleaner for mills which they have recently brought out. It can be used in connection with the same air compressing system employed with the turbo humidifier. The air cleaning system by blowing is already used by many mills equipped with the Turbo-Humidifying System, and now the vacuum system may be combined with it. An efficient vacuum cleaning system that will stand the test of mill use is something that has been striven for ever since vacuum cleaning was first developed and mill men were greatly interested in the demonstration of this machine, and many expressed themselves as satisfied that a satisfactory machine had at last been developed. The Turbo-Humidifier heads attracted the usual attention, and the Parks brothers and members of their staff were busy explaining their devices to many visitors. One interesting feature was a large map of the Eastern portion of the United States thickly sprinkled with flat headed pins, each of which represented a turbo installation. Altogether there were 110, representing nearly 15,000 heads, which considering the fact that the turbo head has only been

on the market for about four years is a striking demonstration of the way it has been received by the mill trade.

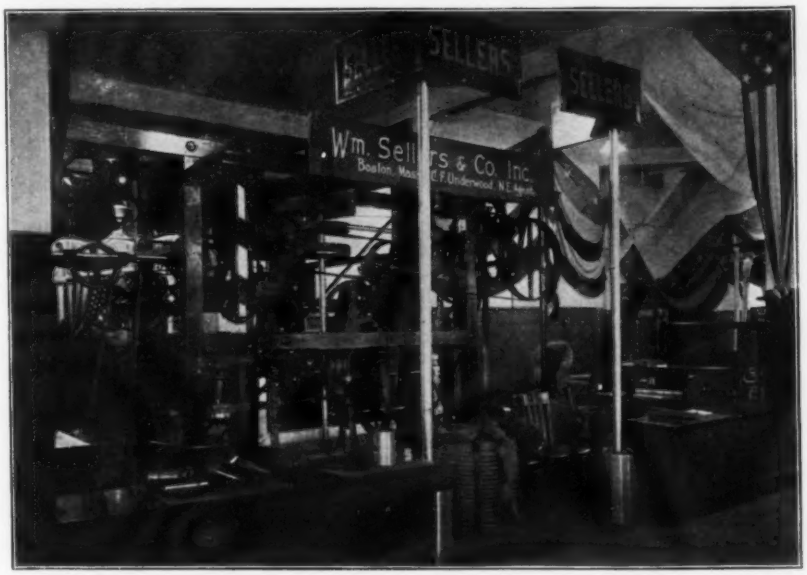
American Tool & Machine Company, Boston, Mass., with Edward J. Eichler in charge showed a line of hangers, couplings and combined oil separators and waste washing machines, centrifugal oil separators and Weston hydro-extractors. They also showed a line of the well known steel pulleys built by the American Steel Pulley Company. It was a large, well located and attractive exhibit.

J. B. Ford Company, of Wyandotte, Mich., with F. S. Klebart, field manager, in charge, showed a line of the different classes of fabrics, yarns and hosiery treated with their well known "Wyandotte" products. One of the features of this exhibit was their sulphur dyed yarn and hosiery which showed a very deep shade of black which under other conditions it has been impossible to obtain. The bleached yarns and piece goods were also conspicuous by their soft and snow white bleach. They also made a specialty of degumming silk, removing all the gum from silks without injuring the fibers, leaving the silk in a smooth condition, and also imparting a luster to it. The shaded silk skeins which were exhibited by this company were supplied by the Sauquoit Silk Company of Philadelphia.

The S. F. Bowser Company, Fort Wayne, Ind., had a large space in which they showed a full line of their storage cabinets, including a 65-gallon outfit for lubricating oil, storage, garage, etc., 50 and 30 gallons for lubricating oil; a filteration tank; outfits for filling oil cans; oil pumps for short and long distance pumping; a portable wheel tank; oil filtration and circulating system; different sizes of registering measures. The increasing stringency of the insurance regulations as well as demands for economy and efficiency in handling expensive supplies like oils, have led to a widespread recognition of the use of such devices as those shown. The exhibit was under the immediate direction of their Boston branch, 141 Milk St.

THE J. B. FORD COMPANY.

Wm. Sellers & Co., Inc., of Philadelphia, showed an interesting exhibit of power transmitting machinery in operation. It illustrated almost every conceivable application of various drives by means of belts and ropes, where power is transmitted by mechanical drive. They manufacture all of the appliances that are used for power transmission machinery equipment. All sorts of pulleys, hangers, binders, frames, guides, rope sheaves, shafting, and various forms of carriers were shown in operation. The ingenious arrangement of the drives was a study for many manufacturers.



WILLIAM SELLERS & COMPANY.

Allis-Chalmers Company was represented by M. H. Merrill, T. J. Lynch, and H. L. Watson of the Boston office; B. Moore of Atlanta office; Fraser Jeffrey of Bullock Works, and F. S. Sly of the Publicity Department. Spaces 33A, 34, 42A, and 43 were occupied by an exhibit of the apparatus of the company, and a comfortable reception space for friends. The steam turbine model attracted a great deal of attention as it gave mill men an opportunity to see the actual construction, and learn its principle of operation. Standard motors, loom motors, starters and switches for textile work were also shown. Allis-Chalmers Company was rather unfortunate in having part of its material lost in a railroad wreck, but it made its space attractive nevertheless.

The Puro Sanitary Drinking Fountain Company of Haydenville, Mass., had their booth fitted up with porcelain basins on which their drinking fountains were installed, being connected with the full city water pressure. The claim made by them is that aside from the sanitary features of their device, it was a money saver to any mill to install on account of the time saved over the old hand cup methods.

The West Disinfectant Company, manufacturers of disinfecting and other appliances, had an exhibit in the gallery. Many textile manufacturers are now using their Chloro-Naptholeum and other products.

Macrodi Fibre Company, Woonsocket, R. I., S. T. Packard and H. D. Ballou in charge, showed samples of the different sizes and styles of fibre spools, including warp spools, shipping spools, jack spools, also cross sections and other parts of the spools for the purpose of demonstrating how they were made.

The Boston Belting Company, the original manufacturers of mechanical rubber goods, had a fine exhibit showing rubber belting, ballata belting, solid woven cotton belting, friction surface belts, red friction surface, and Roxboro Braided Hose, also a line of water, steam, suction and cotton mill hose, American Underwriter's Hose, and all grades of high and low pressure packings, rubber valves and rubber bleachery eyes, and rubber covered rolls. F. F. Alden, F. W. Nichols, and F. T. Donahoe represented the company in explaining the merits of their goods.

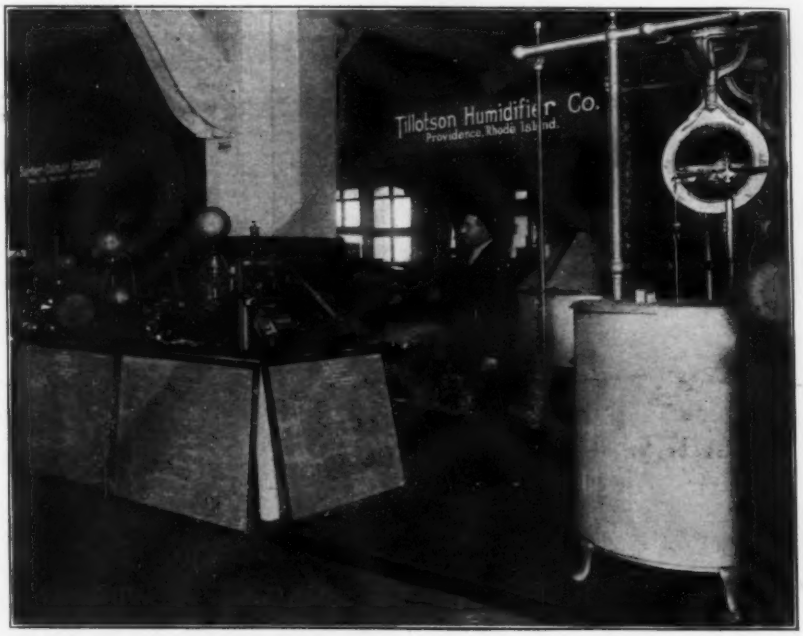
THE BOSTON BELTING COMPANY.

The Automatic Transportation Company of Buffalo gave a working demonstration of their truck for use in mills and warehouses, and for transporting goods from one building to another. At frequent intervals the loaded truck was run about the broad aisles of the Exhibition, showing its easy control by the operator. It is guaranteed to climb a 15 to 25 per cent. grade, and can be stopped short at any point at the will of the operator. They showed a charging Rheostat for charging the batteries from the main line in the building. This truck has been ordered by several large mills.

The Lewis E. Tracy Co. of Boston, agents for Reeves Variable Speed Transmission, wood split pulleys and clutches, were operating a Reeves variable speed transmission driving a line shaft on which was installed a Reeves clutch, bringing out effectively the simple method by which the speed is directly controlled. This transmission is used extensively in textile mills on cotton openers, can driers, singeing machines, washing machines, etc., and is giving excellent results. A line of wood split pulleys from 12 inches up to 48 inches was prominently displayed, also an interesting exhibit of a wood split pulley in process of construction, showing how each segment is glued and nailed with the arms extending completely through the pulley. Several split loom pulleys of the kind on which they are doing a splendid business were noted.

William Carter Company, Needham Heights, Mass., manufacturers of high grade knit goods, had a space in the gallery where they showed a full line of their underwear for men, women, children and infants in cotton, wool, merino, worsted and silk yarn. It attracted much attention and good orders were taken from the visitors.

The Tillotson Humidifier Co., Providence, had a large and striking display on one of the main aisles featuring their humidifier. This is distinctly an evaporative humidifier, powerful in action. Air in large quantities is not only forced over wet surfaces, but actually passes through a fine rain, gathering minute particles of flying water, and is delivered to the atmosphere in any necessary volume in a form and with a force which causes it to "carry" until the free water has been converted into vapor or evaporated and become part of the atmosphere. Among other devices displayed were a yarn steam box, the Greenwood metallic dabber for wool combs, steam traps, etc.



TILLOTSON HUMIDIFIER CO.

The exhibit of the U. S. Gutta Percha Paint Co., Providence, R. I., was well designed to emphasize the value of Rice's Mill White, "The Paint that Brims Over With Sunlight." Two large boards had been painted with Rice's Mill White, one with the "Flat Finish," and the other with the "Gloss Finish." The light reflecting value was obvious, the gloss finish increasing the light 19 to 36 per cent., depending upon local conditions. One of the famous "Automix" barrels was also shown. This barrel is equipped with a churn, by means of which the paint is agitated and kept at a uniform body. The value of this in preventing evaporation, skinning, and keeping the paint clean being appreciated by paint users. The furniture was painted with Rice's Mill White and the walls decorated with photographs of about twenty of the large mills that have been painted with Rice's Mill White.

The Autoforce Ventilating System, Boston, Mass., showed one of the large ventilators by means of which this company "scientifically harnesses the elements" and its operation and utility clearly demonstrated. A working model, easily handled for explanatory purposes, was also shown, and both of these ventilators attracted a great deal of attention, not only from mill men, but from mill and ventilating engineers. On the wall as a background for the exhibit was an im-

mense banner showing the company's trade mark, the "Foul Air" demon.

Cling Surface Company, Buffalo, N. Y., exhibited a machine on which there were two belts, one running tight, the other slack. The belts and load on each belt varied at will by means of spring balances, one belt running tight and untreated, with the other belt

CLING SURFACE CO.

running slack and carrying a greater load than the tight belt were filled with Cling Surface nearly nine years ago. Mr. Charles F. Chase, L. S. Newell, and J. V. Bresnihan were in charge of the exhibit.

The Byrd Manufacturing Company of Durham, N. C., showed the Byrd Knotter and knotter parts in their Space, which was tastefully decorated with the national colors. W. J. Griswold, Durham, treasurer of the Company and J. L. Sanford, Providence, Eastern representative, were in charge and demonstrated their knotters on cotton, silk and worsted.

The Underhay Oil Company of Boston showed samples of their various grades of lubricating oils.

The New York Revolving Portable Elevator Co., Jersey City, N. J., had a practical exhibit of "The Revolvator," their portable elevator with a revolving base. A bale of cotton was used to demonstrate the uses of this device which enables two men to do the work of a dozen men working on the old method. The ease of handling heavy packages was clearly brought out.

The C. J. Root Co., Bristol, Conn., showed their line of automatic counting machines for recording the operations of almost any kind of machinery, whether rotary or reciprocat-

N. Y. REVOLVING PORTABLE ELEVATOR CO.

ing motion. This concern, realizing the increasing demand for counters in the textile trade, has paid special attention to this field in the last few years, and developed special counters for mill use. One use for counters which will show a very great expansion in the next few years is in connection with weaving. In foreign mills weavers are paid

to a very considerable extent on the basis of 1,000 picks. Several big American mills are now using hundreds of counters on their looms. A practical demonstration of the loom counter at the Show was given by the Root "Roco" counters on the loom in the Whitin Machine Works exhibition, and on one of the looms of the Stafford exhibit.

C. S. Marden, New England Sales Manager, located at 8 Beacon St., Boston, Mass., exhibited for the Little Giant Hydraulic Company, one of the Little Giant Hydraulic Pressure forcing machines, used for forcing gears, bushing pulleys, straightening shafts,

C. J. ROOT CO.

presser cylinder heads, and various other things applying to the machine shops and mills in general doing repair work. The demonstrator was kept busy by interested visitors.

In the gallery Meyer Jonasson Company of Boston had an elaborate display of their many styles of ladies' garments on forms which were very much admired by the many ladies that visited the Exhibition.

A section of a two-story mill with a complete air conditioning apparatus in full operation was exhibited by the Carrier Air Conditioning Company.

The centrifugal pump and rotary strainer were driven by one "Spiro" turbine while another was used to drive the fan and a compressor. The rotary strainer which is self cleaning and the pot strainer give double

LITTLE GIANT HYDRAULIC MACHINE.

protection against clogging of the nozzles which are used in the humidifier. These nozzles have a comparatively large orifice but give a finely atomized spray.

The apparatus draws the air through the spray chamber where it is thoroughly saturated and at the same time all dirt and other foreign matter removed. From the spray chamber the air is forced through the fan and ducts into the different floors of the mill. In the air outlets there is placed heater coils for use in winter.

The Carrier Company were showing their "Constant Dew Point" automatic control which holds at the end of the spray chamber a constant temperature of saturation.

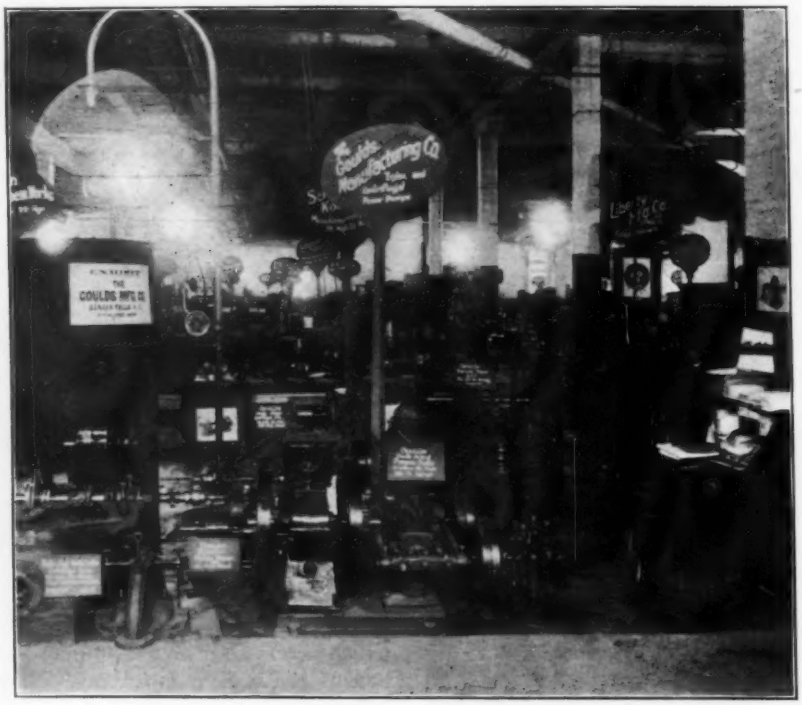
On each floor there was placed a box automatically controlling the relative humidity

and temperature of that floor, independent of the rest of the mill. This control is positive, simple and very accurate.

On account of their simplicity power and small size the "Spiro Turbines" made by the Buffalo Forge Company gave added attraction to the exhibit.

The Link Belt Company of Philadelphia and Chicago had a very interesting exhibit in the form of a group of chain drives operating behind a rotating slotted disc. By looking through the disc two of the drives were seemingly at a standstill, one in a slowly forward direction and one in an opposite direction, the whole operation being to demonstrate the action of the chain on the sprockets. This type of drive has met with wide recognition from the engineering world, and is especially applicable for operation in connection with all types of machines in mill and factories. The fact that a maintained efficiency of approximately 98.2 per cent. is claimed, as well as quietness of operation on long or short centers makes it a most desirable power transmitter.

Lowell Textile School had a very interesting exhibit of their different departments. It included framed pictures of designs done by the students, samples of dyed yarns, interior pictures of the different departments of the school, and finished products of the cotton, wool and worsted piece goods. They also showed many sample cards of the test of the dyed materials to all of the destroying agencies. Their industrial chemical department showed samples of chemicals which are commonly used in the textile industry, together with color lakes and aniline dyestuffs, all of which were manufactured by the students. Samples of work turned out in their machine shop by the students were shown. In the woolen and worsted department were many samples of woolen and worsted from the raw material to the fleece. They also showed the result of tests on raw cotton sent from the Department of Agriculture. Among other



THE GOULDS MANUFACTURING MFG. CO.

samples shown were an exhibit of Egyptian cotton from the raw stock through to the combed yarn. Altogether it was a most interesting exhibit and attracted the attention of many manufacturers as well as others outside the trade.

Dodge Mfg. Co., Mishawaka, Ind., from their Boston office had in operation a counter shaft showing a solid type of "Orton" clutch, and a split type of "Dodge" clutch mounted with a split iron center, wood rim pulley. They also showed the "Independance" wood split pulley and the "Standard" iron split pulley with interchangeable bushings. The bearings used in the counter shaft were of the capillary and ring oil type.

At the foot of the stairs leading to the Convention Hall the Keystone Lubricating Co., Philadelphia, and Boston, exhibited a line of their products which have solved many of the problems of lubrication. The high efficiency of the different greases for all mill uses and the reasons why were ably set forth. Many mills do not give this subject the attention it ought to have, not realizing there is more to it than simply to keep the machinery running.

The American Steam Gauge & Valve Mfg. Co., Boston, had a large and well-planned exhibit of steam specialties in the main hall. The American H_2O grease extracting feed water filter attracted much attention. A new high grade Globe valve, recording gauges, the American Thompson new exposed spring improved indicator, which is their latest improvement and combines every feature of advantage in both inside spring and outside spring types, a full line of gauges and safety valves, and plain and chime whistles were other specialties noted. The superior grade of these products was evident.

GREEN FUEL ECONOMIZER CO.

On ascending stairs to the balcony the visitor traveled in one flight from complex, automatic, 20th century machinery to the

methods of two centuries ago. Here Mrs. J. H. Jackson was manufacturing homespuns, suitings and portieres, using hand cards, an old fashioned spinning wheel, and a loom whose ancestry has been traced back 175 years. There has been a growing interest in Mrs. Jackson and her work since the exhibition of two years ago and she has taken up the manufacture of hand made fabrics commercially and at her shop in Jamaica Plain employs five people. A ready demand is found for all the fabrics she can make and a large Boston retailer has offered to take her entire output.

Among the visiting machinery men was Walter W. Sibson, treasurer of the Philadelphia Drying Machinery Co., who was accompanied by E. L. Smith, New England representative. Mr. Sibson spent several days at the Show. This company had one of the large exhibits at the Philadelphia Exhibition.

Steel heddles made by the Steel Heddle Mfg. Co. of Philadelphia, were used on the loom shown by the Whitin Machine Works and on one of the looms of the Crompton & Knowles Loom Works weaving fine goods. Messrs. Robert J. Freitag, secretary of the Steel Heddle Mfg. Co., and Mr. Hill, their New England sales agent, were present during several days of the Exhibition. They had with them samples of the Duplex Heddle which created much interest from manufacturers wherever shown.

H. W. JOHNS-MANVILLE CO.

The "Textile World Record" occupied a large space near the main entrance which was fitted up as a reception room, in which was displayed their various publications, periodicals, textile books, textile directories, etc. The space was used as headquarters for visiting friends of the "Textile World Record," as well as for the staff assigned to the work of the Convention. Many subscribers and advertisers took the opportunity to call. A stenographer with Oliver typewriter proved of service to many of the exhibitors.

Macullar-Parker Company exhibited a very attractive line of men's cloths, clothing and furnishings.

Jordan Marsh Company had a very attractive display of many lines of fabrics.

Emerson Apparatus Company, Boston, Mass., had an interesting exhibit of the Emerson Fuel Calorimeter, the Thermo Electric Pyrometer, and the Emerson Electric Conditioning Oven. The latter is both electrically heated and regulated and attracted special attention.

THE POWER SHOW

The First Annual Power Show was held in connection with the exhibition of textile machinery under the auspices of the New England Association of Commercial Engineers, the entire basement being devoted to this department. Many of the important power and boiler specialty concerns of the East and Middle West took advantage of the opportunity to display the latest types of power producing machinery, appliances and supplies and the large attendance and intelligent interest amply repaid them for their efforts to make this feature a success.

In connection with the power exhibition there was held the first annual meeting of the Master Mechanics' Association of America which added to the attendance. The officers to whom the success of the First Annual Power Show is due are C. D. Allen, president; Frank A. Morrison, vice-president; H. E. Stone, treasurer, and E. D. DeGruchy, secretary. The directors are T. A. Collins, W. W. Beal, Thos. P. Burke and Gordon Hall.

Many concerns handling power and transmission equipment who have in the past exhibited in the textile show retained their space on the main floor and their exhibits are reported under the textile machinery exhibition.

The H. W. Johns-Manville Co., Boston and New York, featured a boiler covered with asbestos cement and an asbestos manhole gasket that was used four years by the United Electric Light Co. of Springfield. Their display also included a sectional conduit for conducting steam lines underground, the loss by radiation being minimized by the use of asbestos sponge filling. Fireproof asbestos roofing and shingles, also asbestos stucco received much attention.

The Goulds Mfg. Co., Seneca Falls, N. Y., triplex and centrifugal pumps, had an interesting exhibit, including a triplex pump, 4 by 6 inches, for 150 pounds' working pressure; an air pressure and vacuum pump, a rotary force pump, and a double acting pyramid pump. The excellence of these products was appreciated by the large number of mechanical superintendents who examined them carefully.

The Lunkenheimer Co., Cincinnati, exhibited a complete line of high pressure steam valves from 1/8 inch up, in brass, iron and steel. The excellence and faultless workmanship in the details of construction received a large share of attention from engineers and master mechanics. The exhibit also included lines of whistles, oil cups, grease cups and numerous lubricating devices.

The Deane Steam Pump Co., Holyoke, Mass., manufacturers of power pumps for every service, exhibited with the Blake & Knowles Steam Pump Works of East Cambridge, and Clayton Air Compressor Works, also of East Cambridge. A novel feature was the small working models of steam pumps and feed pumps, accurate in every detail, which showed the working of these devices. Prominent in the display were heavy pressure feed pumps, air compressors, Deane triplex power pump and Blake & Knowles open feed water heater.

Eureka Fire Hose Mfg. Co.'s products and also those of the Peerless Rubber Mfg. Co. were exhibited by the Enterprise Rubber Co., distributers. A large space was occupied which was arranged with interesting exhibits of Rainbow belt and packing, Eureka fire hose and the new "acido" boot which is meeting with favor among men in dye houses, tanneries and other places where acids are used.

Green Fuel Economizer Co., Matteawan, N. Y., exhibited a model of the Green fuel economizer which many large textile mills have installed and are using to cut fuel expenses. Specific instances were shown of a saving in fuel bills in a number of textile mills. The exhibit also included Green fans and Green heaters.

Other exhibits included the following:

McLeod & Henry Co., Troy; "Steel Mixture" fire brick boiler settings.

The Schumaker Santry Co., Boston, representing the Terry Steam Turbine Co., Hartford, exhibited a 15 k. w. turbo generator set specially designed for night lighting and exciting large alternators.

The Samson Cordage Works, Boston, operated a testing device to show the relative transmission power of solid braided rope and belting. Samples of braided rope of various sizes were prominently displayed.

Chapman Valve Mfg. Co., Boston; line of valves including electrically and hydraulically controlled self closing gate valves.

Braman Dow & Co., New England agents for Wm. Powell Co., Cincinnati, brass and iron valves, lubricators, oil caps, etc., particularly their line of White Star valves.

Eagle Oil & Supply Co., Boston, New England agents for Perolin Co. of America; samples of boiler compound for mechanically taking scale out of boiler; also samples of piston packing.

The Harrison Safety Boiler Works, Philadelphia, displayed a metering feed water heater with a capacity of 20,000 pounds of hot water per hour which has been sold to the Lowell Textile School; also steam separators, valves, etc.

Robb Engineering Co., Ltd., South Framingham, Mass.; the McDonald shaking grate.

The Holyoke Machine Co., Holyoke and Worcester, Mass., manufacturers of water wheels and power transmission machinery, had an interesting display of their products, including an improved water wheel governor and a new friction clutch of superior qualities.

Schutte & Koerting Co., Boston and Philadelphia; injector, engine stops, electrically controlled valves, etc.

Mason Regulator Co., Boston; speed governor, damper regulator, and reducing valve for steam, water and air.

Oneida Steel Pulley Co., Oneida, N. Y., exhibited a large pulley of their make and design which was used for several years transmitting 750 h. p. A number of smaller pulleys of similar construction were shown.

Nightingale & Childs Co., Boston; 85 per cent. magnesia for pipe coverings and Swartwout steam specialties, including exhaust heads and separators.

A. W. Chesterton Co., Boston; supplies, including packings, gauge glasses, etc.

Albany Lubricating Co., New York; Albany and Alpha greases and Cook's lubricant.

W. B. Pierce Co., Buffalo; flue gas analyzer, boiler tube cleaners for removing scale, etc.

Uehling Instrument Co., Passaic, N. J.; scientific recording instruments for fuel economy.

International Acheson Graphite Co., Niagara Falls; model of electric furnace in which graphite is made at 7,500° F., also graphite greases

The Texas Co., Houston, Texas; loom oils, cylinder oils, greases.

National Tube Co., Pittsburg; Kewanee specialties; testing machine to show how union is tested with air under water.

S. Morgan Smith Co., York, Pa.; hydraulic turbine equipment.

Massachusetts Fan Co., Watertown; Davidson fan in operation; squirrel cage wheel and heating coils.

Taylor Instrument Companies, Rochester, N. Y.; barometers, regulators, thermometers.

Lombard Governor Co., Ashland, Mass.; Lombard water wheel governor.

Jenkins Bros., Bridgeport, Conn., and Elizabeth, N. J.; valves and packings.

Burke Engineering Co., Providence; showing Neemes Bros. (Troy, N. Y.) shaking and dumping grate, also shear cutting shaking grate.

Pemworthy Injector Co., Detroit; injectors, oil and grease cups.

McCord Mfg. Co., Detroit; force feed lubricators, gaskets.

The Richardson Phoenix Company, lubricating engineers and manufacturers of Milwaukee, Wis., through their Boston office at 141 Milk St., exhibited a line of mechanical lubricators, oiling system, and oil filters.

American Oil Co., Providence; line of lubricating oil and testing apparatus for oils.

Warren Webster & Co., Camden, N. J.; air washer and new Webster sylphon thermotor valve.

Climax Smoke Preventer Co., Boston; model of boiler front showing improvel type of smoke preventer.

Monarch Steam Blower Co., Troy, N. Y.; steam soot remover for water tube boilers and super heaters, also show rear end flue blower for fire tube boiler.

Austin Separator Co., Detroit; oil separators, steam separators.

Wright Mfg. Co., Detroit; steam traps, water columns, exhaust heads.

Precision Instrument Co., Detroit; combustion recorder and boiler house apparatus.

Builders Iron Foundry, Providence; Venturi meters for measuring water.

Perfection Grate Co., Springfield, Mass.; model of perfection shaking and chopping grate.

Sherwood Mfg. Co., Buffalo; engine and boiler appliances.

Austin & Doten; Shelby steel tubing made by the National Tubing Co.

Templeton Mfg. Co., Boston; Sterling steam traps.

Locke Regulator Co., Salem, Mass.; engine stops and damper regulators.

Diamond Power Specialty Co., Detroit; five types of soot blowers for all kinds of boilers.

Hills-McCanna Co., Chicago; force feed lubricating pumps.

Pennslvania Flexible Metallic Tubing Co., Boston; flexible metallic tubing for all purposes.

Standard Engineering Co., Boston; instruemnts for operating efficiency, coal scale, recorders of all kinds.

Greene Tweed & Co., New York; Palmetto packing.

The Annual Meeting of the National Association of Hosiery and Underwear Manufacturers.

The annual meeting of the National Association of Hosiery and Underwear Manufacturers was held this year in the First Regiment Armory Building, North Broad St., Philadelphia, Tuesday, Wednesday and Thursday, May 7th, 8th and 9th. The gathering was national in character, being attended by knit goods manufacturers from all over the country. The sessions were held in the Officers' Hall of the Armory, and the exhibition held in the Drill Hall of the building, served to increase the attendance, without detracting from the business sessions, as the exhibition was closed during sessions. Some of the most important business of the Association, which deals strictly with trade matters, was done in the executive session and publicity is not desired.

The address of the president and the reports of the committees told the story of the year's work and showed that a great deal has been accomplished for the benefit of the trade at large. Through the office of Secretary C. B. Carter, the Association keeps in touch with members during the whole year. It is not a body whose activities begin and end with the annual meeting; its real work is done throughout the year. At the open sessions of the Convention, practical papers were read and addresses delivered on subjects of interest to the manufacturers, while at the executive sessions the members got down to the vital questions affecting the every day business matters connected with the purchase of materials, manufacturing and selling problems.

The hotel headquarters of the meeting were at the Hotel Walton, but the real headquarters were at the Armory Bldg., and when the members were not in session, they found their time fully occupied at the Exhibition.

The banquet and smoker held in the Scottish Rite Bldg., Broad and Arch Sts., after the close of the Exhibition on Wednesday night by the management of the Hosiery and Underwear Association for the benefit of exhibitors, manufacturers and their friends was a most enjoyable affair and afforded relaxation and diversion to more than five hundred guests.

Each guest was presented with a very handsome souvenir in the shape of a prettily

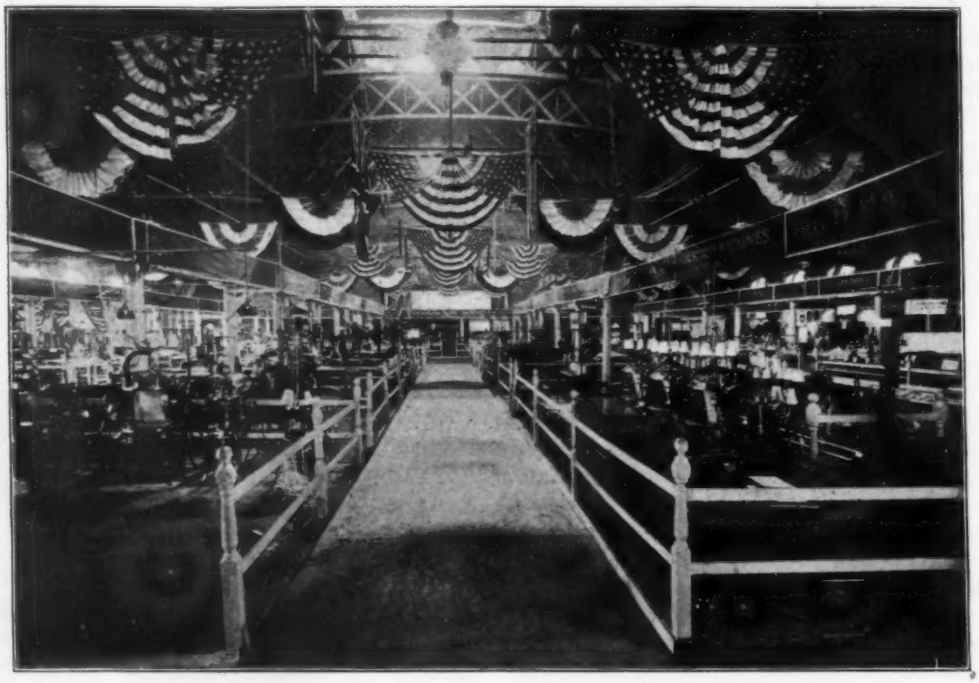
GARNETT ANDREWS, THE RETIRING PRESIDENT

decorated stein, cob pipe, tobacco, etc. The program arranged was lengthy and good, comprising vaudeville, musical and other sketches.

An interesting number on the program was the presentation of a very handsome silver flower vase to the retiring President, Garnett Andrews, the presentation speech being ably delivered by ex-President Simons and very well accepted and replied to by Mr. Andrews in a very feeling and reminiscent vein of thought and both were vigorously applauded.

The opening session was called to order soon after 10 o'clock Tuesday morning. In his opening remarks President Andrews spoke of the rapid growth of the organization and the prominent part it had come to play in the knit goods trade. He touched upon the development of machinery which was shown to such advantage in the Exhibition held in conjunction with the meeting. He also alluded to the changes which are taking place in methods of merchandising, and urged manufacturers to keep up to date in all branches of their business so that they should not be left behind in the rapid march of progress. The protective tariff has enabled manufacturers to retain the greater part of their home market, and as a result of the progress in machinery and merchandising methods, he said, consumers are enabled to secure goods as cheap or even cheaper than years ago.

Mr. Andrews touched on an interesting question in the hosiery field, one that has puzzled manufacturers greatly in the last few years, namely that there is no intermediate price to the consumer between a 15 cent and a 25 cent stocking. At 20 cents he thought manufacturers would be able to give a most excellent value, but the jobber or retailer finds it difficult to market such priced goods. Mr. Andrews spoke of the child labor laws in the Southern states, and said that the conditions there were constantly tending towards improvement, and there had been much misrepresentation about the subject.



GENERAL VIEW OF THE KNITTING MACHINERY EXHIBITION.

At the conclusion of Mr. Andrews' remarks he introduced Mayor Blankenburg of Philadelphia, who welcomed the delegates to the city and won their hearty applause by his statement that the protective tariff has so revolutionized the business that the output of American hosiery and underwear is now double that of a few years ago, and we can now challenge the world on these goods.

The report of the Executive Committee and the annual reports of the officers were then presented. Following the reading of the reports the meeting listened to the addresses by invited speakers.

ANNUAL REPORT OF BOARD OF DIRECTORS

To the Members of the National Association of Hosiery and Underwear Manufacturers.

The Association's experiences during its short career has demonstrated the desirability—in fact, the necessity—of doing something of real monetary benefit to the individual member. The fact that Associations are good things if they merely bring competitors together on a friendly basis is good and sufficient cause for the creation and advancement of Associations; at the same time there is no reason why all the phases of usefulness of an organization should not be developed. Various reasons may be attributed to the inactivity in some directions of our Association, but it is not our purpose to criticise previous efforts. We have learned much from past experience and should consider our mistakes as stepping-stones to greater success. It behooves us to be up and doing if we hope to attain our greatest usefulness, and looking towards this end we shall endeavor to bring to your attention ways and means for such attainments.

Only one formal meeting of the Officers of the Board of Directors was held during the year, although there has been frequent conferences of several of the Officers at intervals during the year, and we have also been in close communication with each other by correspondence direct and through the Secretary's Office. The meeting of your officers was held at the Manufacturers' Club in Philadelphia, on Jan. 11, 1912, an account of this meeting being published in the January issue of The Knit Goods Bulletin.

Among the many subjects discussed at the Board meeting was that of Cost-Methods and Trade-Mark Goods. Special Committees were appointed both from the hosiery and underwear members to consider ways and means for deciding upon some practical cost-system that could be adopted by the Knitting Manufacturers at the least possible outlay of time and money. Unfortunately the underwear members of the Cost-Committee have not been enabled to get together prior to our Convntion to discuss this matter, but we hope they can arrange to have a meeting and present a report at a later session. The hosiery members of the Cost-Committee have also been unable to prepare a system along the lines suggested by your Officers; however, Robert Blood, the Chairman of the Committee, will advise you in his report the developments in this line of work.

We were successful in securing S. R. Latshaw, of the Curtis Publishing Company, to address us on the subject of Trade-Mark goods, who has selected as the subject of his address: "Modern Methods of Merchandising."

The Secretary has already incorporated in his report a number of topics that should receive your mature consideration, but there are some special subjects which he has not touched upon to which we invite your careful attention.

MAINTENANCE OF PRICES

Your President has addressed our members several times during the year, impressing upon them the importance of not only maintaining prices on a declining yarn market, but also to advance prices in conformity with the increased cost of raw material. It really ought not to be necessary for the President of our Association to find it necessary or even desirable to issue such a plea, but competition has reached such an acute state that it seems impossible for the manufacturer of his own violation to protect himself no matter what the contributing circumstances are.

CANCELLATIONS

Another subject very nearly related to that of maintaining prices, is that of cancellations on a falling market. This evil, of course, is not noticeable on a rising market, but at the first indications of a slump in yarns, the Knitting Manufacturers are quite often requested by some buyers to cancel orders previously booked. Too much praise, however, cannot be given the great majority of the knit goods buyers who faithfully live up to their contracts. We realize fully that many of our members have taken a determined stand and will not accept cancellations unless they deem it wise, owing to questionable credit standing or other contingencies, making it to the manufacturer's advantage to release the contracts.

Your Board of Directors wishes to place itself on record as opposed to unjust cancellations and recommends the adoption of strong resolutions in condemnation of such practice.

KNIT GOODS BULLETIN

The publication of The Knit Goods Bulletin has also greatly outgrown our fondest expectations. It affords an exchange of views and the transmission of information from member to member in a most pleasing manner, enabling us at the same time to keep non-members in touch with our work, and gradually educating them to the point where they are anxious to become members. We believe that conditions not only justify a continuation of this publication, but that same be increased, provided good material can be secured for publication, and to this end we urge the individual members to send to the Secretary letters and communications for publication from time to time.

CHANGES IN BY-LAWS

At the last Annual Convention decision was reached that the By-Laws should be changed providing for a Secretary and a Treasurer. Owing to the fact that the By-Laws could not be changed without the members having been notified, action was postponed until this Convention, and the office of Assistant Treasurer was created, which has been held by Robert C. Blood during the year. We therefore recommend that sections 1, 2 and 3 of article IV, be changed to read as follows:

Section 1. The Officers of the Association shall consist of a President, two Vice-Presidents, Secretary, Treasurer and a Board of Directors. The President and Vice-Presidents shall be ex-officio members of the Board of Directors, and all shall serve without compensation except the Secretary and the Treasurer, the amount of whose compensation shall be fixed by the Board of Directors.

Section 2. The President, the two Vice-Presidents, Secretary and Treasurer shall be elected at each annual meeting of the Association, and shall hold office for the term of one year, or until their successors are elected and qualified.

Section 3. The Secretary shall receive instruc-

tions from the Board of Directors and need not of necessity be a member of the Association.

We also recommend that the following be added to the By-Laws:

Section 2, Article VIII. The Treasurer shall be a member of the Association and have charge of all funds due the Association, collected by the Secretary or received direct. He shall approve all vouchers and countersign all checks subject to instructions of the President.

ANNUAL REPORT OF THE SECRETARY

We are again assembled, as an Association, to not only review the year's work that is now drawing to a close, but also in an endeavor, and with strong hopes of success, of reaching wise conclusions through frank discussions and an exchange of views, on many of the serious problems confronting the Knitting Manufacturers. While we do not wish to unduly impose upon your time in presenting details of the year's work, yet you are entitled to a summary report of our efforts and accomplishments. The columns of the Knit Goods Bulletin and the many circular letters that have been issued to the membership, has kept you fully posted regarding our efforts during the whole year, but there are some special features to which we invite your attention in this Annual Report.

GROWTH OF MEMBERSHIP

Inasmuch as the Association's existence and its field of usefulness is dependent upon the cooperation and support tendered by the Knitting Manufacturers, you will be interested in knowing that our membership has had a healthy growth during the year, 42 Active Members and 20 Associate Members having been admitted to our membership. In view of the fact that the Knitting Industry has experienced a period of severe business depression since our last convention, we naturally feel very much elated at the progress that has been made. As will be shown by the Assistant Treasurer's report, the financial support we have received from the Active and Associate Members has been much larger, and we believe, more generously tendered than at any time in the past history of the Association. The receipts from Jan. 1, 1912, to date, has been greatly in excess of our income during the same period of last year, and we venture the prediction that our report for the fiscal year ending December 31, will show an even more healthy state of affairs in connection with the Association's financial standing. We were successful in being able to pay in full the old Tariff Committee deficit amounting to sixteen hundred dollars, which had been carried over for several years, otherwise the Treasurer's report would have been much more gratifying, in so far as cash balance was concerned.

COST FINDING AND EFFICIENCY WORK

In looking over last year's Annual Report we find that considerable mention was made of cost finding and efficiency of work. The members present at our last Convention were not fully convinced that the time was ripe for any concerted action along this line, although a Cost Committee was later appointed, a report from which will be read at this session. We feel that there is a wide field of opportunity to be developed along this line, and we take the liberty of quoting in full this section of last year's report.

The question of cost finding has been given considerable attention practically eevr since the Assosiderable attention practically ever since the Assofeature of the manufacturing business, while the most important one, had not been given the attention it deserves and actually requires. Papers have been read at the Annual Convention discussing this question in a general way, and various plans have been devised in an effort to bring about improved conditions.

The sub-division of the various branches of our industry in Sub-Association has brought this question more prominently to our members' attention, and possibly the greatest achievement the members of the Sub-Associations have to show from this special line of work is a better understanding, of not only the elements of expense constituting the cost of manufacturers, but also a more correct realization of the actual expense. The most forcible plan that has so far been devised in arriving at a proper understanding of costs was that of different manufacturers exchanging views, and from this experience, condensed statements were forwarded to each one cooperating, giving average cost under each heading.

NET WEIGHT YARN MOVEMENT

The question of purchasing yarns upon the net weight basis has not been overlooked by the Knitting Manufacturers, although little has been published in The Knit Goods Bulletin on the subject. We have no accurate figures upon which to base our estimate, but we are satisfied that 50 per cent. of the knitting yarns used are sold to the manufacturers upon the net weight basis. The large users realize the saving effected through this method and are demanding these terms, and getting them. Many of the smaller users realize it is to their advantage to purchase on the Net Weight Basis, but are unable to put up a sufficient fight to secure this recognition, and the yarn men use such instances to show other manufacturers that Net Weight yarn movement is a dead issue. It's very live corps as we view the question, and we hope the subject will be well discussed, and that the action taken upon the question at this Convention will awaken the manufacturers to the importance of their standing firm in their demands to have delivered to them the actual number of pounds of yarn for which they pay.

CONTRACT PRICES

Contract prices should always be maintained. Our attention has been called quite frequently during the year to the tendency upon the part of many manufacturers to cheerfully make concessions to the buyers on contracts when the yarn market showed a slump, although the manufacturers had doubtless covered on yarns at a much higher basis when the original contract was accepted. Such action is manifestly unjust, and we cannot understand why a manufacturer should fall so easily in granting such unreasonable concessions. When we consider the fact that there has been a material increase in the price of all ma-

terials used by the Knitting Manufacturers during the past few years, and that the manufacturers are selling goods cheaper than ever before, is it any wonder there is a spirit of unrest and dissatisfaction prevailing among the mill owners? One of our members advises us that the percentage of increase on materials runs from 75 per cent. minimum to 100 per cent. maximum. Isn't it time you were awakening to the fact that you are losing your inheritance as a Knitting Manufacturer? Are you not entitled to a remunerative return from your efforts and investments? Does your annual statement show this, and is the money in the bank to your credit as evidence? Gentlemen, there is some way to improve these conditions and it is up to this Convention to find a remedy for the trouble, and when found you must have the courage to follow the prescription.

THE CREDIT BUREAU DEPARTMENT

The development of the Association's Credit Bureau and Collection Departments have shown substantial progress during the year. A large proportion of our members have tendered their cooperation and support. Practically all the new Active Members that have been admitted to the Association during the past year have come in largely on account of the facilities afforded them through this department. Of our total membership of nearly 500, about 350 are cooperating in our Credit Bureau Department, and they assure us that they find same of decided advantage in their Credit Departments—many preferring our system to any other mercantile agency or reporting system on the market. In addition to the Rating Books that are furnished our subscribing members complimentary, we have developed a special reporting feature that is proving very helpful to them. For instance, a member may find one of his customers falling behind in payments and can obtain no definite cause for such delay. Under our system he asks our office for a detailed report from our other members selling the concern in question. Upon receipt of such request we immediately send proper blanks to all the members whom our records show have or are doing business with the concern, a portion of our inquiry blank reading as follows: "The Confidential Trade Reports covering our member's actual experience with the knit goods buyers for the special and individual benefit of the members reporting, have proven of so much value, that it has been decided to continue this feature to an even greater extent in the future; that is, we are prepared to serve our members in this direction to as great an extent as they are willing to cooperate and have need of such credit protection.

OFFICIAL PROGRAM

In view of the success that has followed our efforts in the preparation of this year's Official Program, and looking towards even enlarging its possibilities, we shall hereafter refer to same as our Annual Program and Year Book. We feel quite sure you will find this year's book one of usefulness all the year round, as we have incorporated in same many new features that should make it a ready reference book, and we want to have your suggestions the coming year as to subject matters that may be embraced in the next issue that will make this publication one most eagerly sought after.

Our Exhibition this year needs no special introduction. The demand for space from exhibitors necessitated our securing a larger hall than those used in previous years, and we have been successful in filling same to its capacity.

In conclusion your Secretary wishes to express his sincere thanks to your President, the Officers and the individual members for the many courtesies extended and the assistance rendered.

Respectfully submitted,

C. B. CARTER,
Secretary.

REPORT OF COST COMMITTEE

Secretary Carter read a letter from Chairman of this Committee to the effect that they would not get ready to make an official report but that progress was being made enveloping a system of cost finding suitable for knit goods manufacturers.

A motion regarding this matter was made by Mr. Simons to have it printed in the Bulletin as soon as it was ready so that the members of the Association could get the immediate benefit of it.

"THE LIGHTING OF KNITTING MILLS"

By R. S. IREMONGER of the General Electric Co., Schenectady, N. Y.

The mill manager of today has a choice of many types of lighting units which may be divided into two classes, namely, incandescents and arc lamps. The incandescent group may be sub-divided into the following units, Carbon lamps having an efficiency of 3.1 w. p. c., the Gem lamp an efficiency of 2 1/2 w. p. c., and the Mazda lamp an efficiency of 1 1/4 w. p. c. The arc lamp may be sub-divided into enclosed carbon intensified vapor, magnetite and flame. The last two are large units and should not be used for interior lighting in buildings having low ceiling heighth and will therefore not be considered in this paper. The logical unit is therefore the incandescent lamp.

The first and most important advantage of good lighting is to increase production during the dark hours. About 12 per cent. of the operator's time is lost in moving the lamps from one part of the machine to the other for the purpose of making adjustments and inspecting the work. Such loss is entirely eliminated when the lamps are hung out of the operator's reach, and therefore the time wasted in handling lamps can be utilized in manufacture. One of the chief obstacles to chief production in any manufacturing plant is spoilage. Census experts claim that the spoilage on all goods manufactured in the United States to be at least 1 per cent., to 1 1/2 per cent. of the total production, also that 75 per cent. of the total spoilage occurs during the hours of artificial lighting. This spoilage could be reduced at least 25 per

cent. by good illumination, so that the cost of a lighting installation would more than pay for itself in a year. For example, let us assume a plant manufactures $100,000 worth of goods per year, the spoilage would be between $1,600 and $2,000 per year. Let us assume that $1,000 of this spoilage was caused by poor lighting and approximately a minimum of $250 could be saved by good illumination. This $250 would more than pay the difference between the cost of a good and a poor lighting system, and also give a good return on the money invested.

There are three methods of lighting known as general, local and composite illumination. In general illumination the units are equally spaced, giving an equal intensity of illumination in all parts of the room irrespective of the location of machines or processes. This system of lighting employs rather large units and is not recommended for lighting knitting mills. The one great objection to this form of lighting is the sharp window effects on the work. It is however recommended for lighting of shipping rooms and that portion of a factory devoted to portable machinery. With local lighting each operator has one or more lamps over his work. This form of light is found in the majority of knitting mills, because it is the cheapest and most efficient means of light for the knit goods manufacturer.

Composite lighting is a combination of both general and local illumination, producing a low intensity of general illumination throughout the room, thereby giving it a cheerful appearance when supplemented by a high intensity of local lighting. It is largely finding favor in most of the modern plants. The knitting industry may be divided into three classes, namely flat goods knitted on circular spring needle machines, ribbed goods knitted on circular latch needle machines, and hosiery. Both white and colored goods are knitted on these machines and each presents a different problem to the illuminating engineer. Many of the manufacturers purchase their yarns in the open market, and the question of lighting spinning frames will not be discussed in this paper. The first process is, therefore, cone winding. The yarn is received in skeins or on cones and is then rewound on bottle bobbins. The frames vary in length from 12 to 16 feet, and a most economical method of lighting these frames is to place 60 watt Mazda or Tungsten lamps in the aisles spaced approximately 12 feet center, and hung about 7 feet, 6 inches from the floor, the lamps being equipped with a reflector that will give an extensive or a spreading distribution of light. It is important that these frames should be well lighted, enabling the operator to inspect the yarns and properly tie up broken ends. The size of the units recommended may seem a little large, but the cost of light is very small, provided perfect yarns can be produced, for it is well known that imperfectly tied yarns will bunch in the knitting machines, making a hole in the cloth, or may even result in a smash. Needle moulding is considered bench work and a 40 watt Mazda lamp equipped with a reflector giving an intensive or concentrated distribution of light should be placed for each operator.

The cylinder spring needle machine, both leaded and trick needle machines, present practically the same problem in lighting. If these machines are equipped with a take-up, a 40 watt lamp should be placed in the aisles spaced approximately 6 to 7 feet centers, hung about 7 feet 6 inches above the floor and equipped with a reflector giving an extensive distribution of light. This would enable the operator to inspect the finished product and to see that the proper degree of tension is maintained on the needle. A light of sufficiently high intensity allows the operator to see whether the pressure is too tight so as to prevent breaking the yarn, and if the pressure is not enough, to see that the needles do not load up. By such precaution the number of seconds can be materially reduced. The latch needle machine can be lighted in the same manner as the spring needle machines. Many operators want a lamp placed directly over the machine, and if the lamp is accidentally broken the glass is liable to fall in the machines, causing considerable damage to the delicate parts of the machine.

Full-fashioned hosiery is made on flat knitters which are from 10 to 16 feet in length. A 40 watt Mazda lamp should be placed approximately every 3 to 4 feet directly over the needle beds. For machines knitting colored yarn or silk, a 60 watt Mazda lamp should be substituted for the 40 watt lamp. These machines require a high intensity of light so as to enable the operator to watch the threads as these machines have no automatic stops when a thread breaks. A broken thread will cause the goods to be classed as seconds and this can be prevented only by giving the operator a sufficient intensity of light to enable him to watch the entire operation.

Gloves are knitted on tricot or fact warp machines, which are approximately 18 feet long. The silk is generally white and a 40 watt lamp equipped with an extensive reflector hung approximately every 3 feet will give ample lighting for these machines. For Milanaise machines having a revolving warp, a 60 watt Mazda lamp should be placed in the eisle every 5 feet so as to enable the operator to see the threads properly.

A most important department in a knitting mill is the finishing department. Practically every process in this department has a special machine and requires special lighting. Until the finishing department is reached, all knit goods present the same appearance to the average layman, but in this department certain distinctive features can be introduced, such as the method of binding, the stitching of seams, and the general finishing of the underwear so as to make the article attractive to the consumer, and the manufacturer that shows the greatest taste in finishing fabrics is the one who has the largest sales.

When the rolls of cloth are removed from the knitting machines the right side of the cloth is on the inside of the roll, and the first operation is to place this on the turning machine. An intensity of approximately one foot candle is required to light these machines and can be obtained by placing a 40 watt Mazda unit approximately every 10 feet. The cloth is then sent to the cutting tables, which vary in length from 12 to 20 feet. Here the cloth is cut in to the desired patterns. Formerly the cutting was done with a long knife pushed up

and down through slots in a table arranged to suit the size and style of garments required. The modern method is to use an electric cloth cutting machine which is generally equipped with a small lamp directly over the knife, enabling the operator to see the patterns clearly. It is recommended that 60 watt Mazda lamps be placed over these tables spaced from 7 to 10 feet center and hung about 5 to 6 feet above the tops of the tables. After the cloth is cut it is then turned over to the loopers. A 25 watt Mazda lamp equipped with an intensive reflector should be placed over each looper, or one 40 watt lamp for every two machines. However, to prevent excessive shadows and prevent the operator from being in his own light, an individual lamp is recommended. The goods are then sent to the seamers to be stitched.

There are a number of types of sewing machines used for seaming and these should be lighted by a 25 or 40 watt Mazda lamp, or a 60 watt Gem lamp, hung approximately 24 inches above the table and from 12 to 16 inches to the left of the head of the machine. These lamps should be placed sufficiently high to prevent their being broken when the goods are thrown on the table. The size of lamp depends on the quality and color of goods manufactured. Buttonhole and button-sewing machines should be lighted in a similar manner to sewing machines.

A 60 watt Mazda lamp equipped with an intensive reflector should be given to each inspector, as his work requires an abundance of light.

The above suggestions are not intended as actual specifications, but are considered as a few pointers which the mill manager may find of some assistance in contemplating making a change in his lighting installation during the coming year.

All the large lamp manufacturers maintain a competent staff of illuminating engineers whose services are freely offered to any mill owner desirous of having a lighting layout made for his particular plant.

THE RELATION OF THE INCREASED COST OF LIVING TO THE KNIT GOODS INDUSTRY

By CHARLES VEZIN, 349 Broadway, New York

Reference is made by some writers to periods of rising prices when gold production was stationary. All authorities agree that there was a sharp rise in prices after Columbus turned into Europe the new supply of gold, and again when the Argonauts of 1849 turned on the yellow flood from California. The violent rise of recent years has been coincident with the discoveries of gold in South Africa and in Alaska, but even greater in effect than these discoveries are the modern methods of mining which practically eliminate the labor and dangers of the old time ways. The period of 1870-1871 is quoted as one in which prices were high, whilst the gold supply was stationary. This was the period of the Franco-Prussian war, when several million men were directly and indirectly consuming and destroying commodities beyond the normal rate, and were removed from the fields of production of such commodities. Such a factor must have made itself felt in the markets of the world. Other periods are named when gold was not produced at a rate to keep pace with the growth in population, but commodities advanced. It will be found that during such periods there was a great increase in the supply of silver, which, at that time, shared with gold the function of a direct medium of exchange, —a condition which has ceased to exist since the demonetization of silver. When silver and gold were practically a bi-metallic standard the increased supply of silver relieved the pressure on the demand for gold even in gold standard countries, and the increased supply of one of the metals acted the same as at present does the increased supply of the sole remaining money metal.

All such currency, other than gold, is not an increase of the medium of exchange at all,—it is simply a multiform of expression of the medium issued for convenience.

The difference between the increase of credit money and the increase of gold is that with the increase of all credit money there is incurred a corresponding liability. It is because all good credit money will ultimately be called in to be redeemed in gold coin that there is no inflation of the currency as in an increase in the supply of the metal, gold.

Some naive economists say:

"The dollar, pound, franc, mark, etc., have become a sort of abstract—a psychic thing . . . a mental measure of value, of which the original coin has long ago ceased to be the physical foundation. In fact we no longer depend on so crude and barbaric a thing as the exchange of coin, etc."

They think that as long as people only believe that a dollar's worth of gold is a dollar it always will be a dollar, no matter how plentiful the metal becomes. It does not lose the name of "dollar," but may lose all else.

There is no credit money for which gold is not the hostage, actual or prospective.

There is no difference between payment by cheque and payment in gold coin. The financial genealogy of every good cheque is the same. The coin is first deposited by some one in some bank. The cheque simply orders the transfer of this coin into other hands. It is only because it is more convenient that we do not call for the coin and hand it over to our creditors. It is true that very few people deposit coin in their banks but they deposit cheques that represent an actual deposit of such coin by some one. It may be a thousand transactions remote. If all the world's banking records were wiped out to be started afresh the initial operation would be to deposit gold coin. Against that deposit we could draw cheques which could in turn be deposited by their payees, and we would once more start on the present methods of bank deposits and payments by cheque. The repeating of this process a million times does not increase the currency any more than the passage of the coin a million times. It is not credit money at all, it only quickens and simplifies the operation of payments and makes it safer.

Brown sells Jones $100 worth of wheat, Jones sells Smith $100 worth of harness, Smith sells Brown $100 worth of furniture. They need not exchange one bit of actual money in all these transactions. The one transaction balances the other and obviates the necessity of exchange of

coin,—it is simply the record of the transaction in the shape of cheques; these cheques are cancelled and simply become receipts. That they pass through the mediation of banks makes no difference, no money has changed hands, only the several commodities have. The parties have bartered what they had and did not need for what they needed, and the money valuation was simply a measure of value.

How this cheque system works is demonstrated by the system of foreign exchange, which is simply a matter of international cheques. There is a consequent exchange and crossing of these international cheques between America and Europe, and there appears to be no actual payment of money. This is simply that one transaction balances the other. As soon as the balance of trade leans decidedly one way or the other, so that these transactions fail completely to balance, the difference must be sent in gold coin, or gold bullion, and we then have either gold exports or imports.

This is the story of all cheque transactions that do not call for the delivery of currency, and they are not credit money.

Another question is the effect of bank credits, that is, the line of credit enjoyed by the customers of National Banks in return for the average yearly balance they may carry, quite distinct from the ordinary banking operations as expressed by deposits and the drawing of cheques. It is claimed that in this way the available money that a firm may use in its business may be doubled or tripled, thus constituting another inflation of the currency with a consequent increased cost of commodities. Such "inflation" in no way affects the standard any more than the issuance of bank notes and United States Treasury certificates before referred to, and for the same reason, namely, that the issuance of such bank credits puts upon the recipient invariably a corresponding liability and really is no permanent net increase in the media of exchange as is an increase in the supply of gold.

In 1909 I wrote in connection with the increased cost of living:

"This question will bring to the front with fierce intensity the tariff issue."

It certainly has been fought in a way fierce, intense and mendacious.

The tariff has been used for the pretty little game called "Putting Taft in a Hole," with no idea of enacting any legislation, with a view to putting the President in a position where he must either sign a bill contrary to his promises or veto one supposed to give relief to the consumer. Either course being thought fatal to him.

In the Mohonk region the general occupation of the woodsmen is huckleberry picking. These men are constantly setting fire to the woods because the forest fire is followed the next year by an increased huckleberry crop in the burned area. In order to produce this they destroy most magnificent woods, including primeval hemlocks and burn into a ghastly cemetery one of our country's most beautiful regions. In like way the huckleberry politician is trying to burn down American industries, under the pretence that it is going to reduce the cost of living-for the masses, and hopes to pick the incerased crop of huckleberry votes at the next election.

It is refreshing to find one prominent Democrat, Mayor Gaynor, a free-trader at that, give the true cause of high prices, the increased production of gold. The huckleberry politician is making capital out of a perplexing economic change by laying the blame at the door of the Republican party. They would succeed in lowering the cost of living slightly and temporarily through the means of a period of financial and industrial disaster. Such periods always bring with them low prices, but at what cost! At the cost of idle multitudes, and the reduction of incomes that much more than offset the economies incident to low prices induced by lack of purchasing power.

It is said that the sentiment of the country on the question of protection is changing. It is not. The change is only one of location. There is a drift against protection in the Middle West which would be fully offset by a change of sentiment in the opposite direction, in the South if it could be made to count. It cannot be made to count because of the negro question, which prevents southerners from voting for what are considered Republican tenets.

The increased cost of living does not extend to hosiery. The consumer is getting more for his money then ever before. Clerks and shop-girls are wearing silk hosiery. In fact, just at present they will have nothing else. The term "silk stocking element" to denote the rich has become obsolete. The thing to give us most concern is not so much the increased cost of living as the increasing cost of living. I am aware that there has been a slight recession in this cost of living in the last two or three years. This is but a countercurrent. Our trouble is that all we buy costs more and what we sell brings less. The only thing that saves us is enlarged output with its economies of production.

I have no remedy to suggest,—I am diagnosing the case. The first step in the cure of disease is to recognize the cause. There is no use in suggesting treatment until you know whether the patient needs a stimulant or a sedative. We must all of us first recognize that when we sell today an article for one dollar it is no dearer than if we had sold it for seventy-five cents in the year 1900, and that is the point of my discourse.

At the Wednesday morning session there was a disappointment in the shape of a letter of regret from Hon. J. Hampton Moore of Pennsylvania, who was unable to address the meeting on account of pressing legislative business in Washington. The members were particularly anxious to see and to hear from Congressman Moore, who has done such good work for the protection of their industry. W. W. Smith addressed the meeting on a subject which has received particular attention from the Executive Committee during the year.

THE USE AND ABUSE OF SPECIAL PACKING

By W. W. SMITH, Estate of Thomas Johnson

Many manufacturers look on the printer of this Special Packing as a necessary evil, and not as commercial necessity, whose interests lie side by side with the manufacturers. True it is, that many of the printers throughout the land are necessary "evils," but this comes from the fact that the manufacturer, in order to effect a slight saving in initial cost, prefers to take advantage of the ignorance of his own little country print shop (which is often run as an accessory to a weekly newspaper), and turns his work over to a printer of this nature, expecting to get the same high quality of workmanship that he can from the specialist. The result is, the small printer knowing nothing of the finer requirements of this specialty, does the best he can, and his best is generally far worse than the poorest the manufacturer could expect from those in the trade more fully equipped to turn out a production of merit. The smallest printer is really not subject to blame, for he thinks because he is given the opportunity that the manufacturer sees in him a workman of ability, and does not realize that he is being used only from the standpoint of price.

The "price hunter" in all trades is a great deal like the "duck hunter," except that he secures no sport or enjoyment from his efforts. The game that he bags usually costs about ten times what it would cost if he had gone to a good, reliable place and paid a fair price for it. This holds good with knitted productions as well as with printing.

How many manufacturers who favor printers with their trade realize the investment that is necessary before the printer can execute their orders? Each order for a Band and Label requires the following details and expenses:

First:—An artist's drawing.

Secondly:—From one to four zinc etchings for each Band and Label, depending on the number of ink colors used.

Thirdly:—A large quantity of special paper stock, of different colors, weights, finishes, etc.

Fourthly:—A force of specially trained workmen able to handle orders with intelligence and dispatch.

Fifthly:—A large investment for machinery, types, etc.

For instance, take for granted that the manufacturer orders 500 Bands and 500 Labels requiring special engravings. The cost for the first order, which might never be repeated, and then the printer would be left to charge his expenditure to the profit and loss account, which in that case would be all loss. Suppose the order calls for work in one color, the investment would be, as nearly as I can figure it from a specially prepared Cost System, about as follows:

Drawing and Artist's services	$1.50
Zinc etchings for Band and Label	1.50
Composition time	.50
Paper Stock	.18
Press Work and Ink	1.50
Cutting, Tieing and Shipping	.25
Office Expenses	.25
Total net cost	$5.68
Selling Price	1.05
Our loss on first order	$4.63

More elaborate productions naturally would increase the printer's proportionate loss, and we could not long continue to exist at this rate; it is only by the receipt of duplicate orders we are enabled to reduce these losses and eventually turn them to profits.

If the manufacturers will allow the printer proper consideration, and not look on his as a "Captain Kidd" in disguise, trust him to be straight and honest, he will be almost sure of satisfactory service and quality at a fair and legitimate price. When a manufacturer becomes convinced that his business is not earning what it should, he has but two ways open to him to put conditions in better shape: he can either raise his prices, or he can endeavor to study methods of cheapening the cost of production.

To draw closer to my assigned subject; as many of you gentlemen are aware, I represent a firm that has been for the past quarter of a century making a specialty of printing, exclusively, for the Hosiery, Underwear and Knit Goods Trade, and I feel our experience will be about the same as that of our competitors in similar lines.

About the time that the founder of our house conceived the idea of making this business a specialty, the advertising of certain lines was in its infancy. Manufacturers, generally, simply used a plain Band and Label, with some sort of design to make them the least bit attractive. The result was that while these Bands and Labels answered the purpose for which they were intended, that was, to pack and describe the goods, they did not long serve to disguise the mill or manufacturer making the goods.

Buyers quickly learned the different styles of packing and could tell at a glance by whom the merchandise was made, and in consequence knew how to price the goods to make them a little lower than their competitors. So as to advertise his own particular line, and to disguise the source of the good's production, some wide awake jobber or sales agent conceived the idea of adopting a particular style of printed trade mark that was readily remembered and easy to advertise, and started a campaign that has resulted in every leading jobber, sales agent and department store following suit and doing likewise.

Today advertised brands seem to have the greatest call, and naturally every distributor aims to adopt a design or worded phraseology that is attractive enough when used on goods of some merit to bring a return purchase.

Speaking for my firm I can say that we fully realize the trouble you are occasioned in being required to order direct from us Bands and Labels for these many special packings. We would far rather have the different firms that have adopted trade-mark packing do the distributing than to refer the manufacturers to us. This is practically true of the very small orders we receive. Would it not be of greater advantage to all concerned if the jobber, selling agent and department store would semi-annually place an order with the

printer for such bands, labels, rider tickets, stickers, box fronts, etc., as they will use for the season, keeping on hand a supply that would allow them to send to manufacturers direct, from their offices, when placing orders for goods, such quantities of the different details as might be needed to pack the order in accordance with their desires.

This method would be the means of creating a considerable saving in cost to the manufacturers, and make impossible the delays in delivery, also would insure absolute uniformity of packing, which would be a benefit to the jobber himself.

It is but natural that we can print large orders for Bands, Labels, etc., at a lower figure than by dealing them out in small lots, as the most of preparation to print small lots is almost as great as it would be for the larger quantities.

My firm has started a campaign whose ultimate result we hope will cause the universal adoption of these suggestions, and we will welcome any aid you can give our efforts. To think it would then be possible for you to receive direct from the jobber just a sufficient quantity of Bands, Labels, etc., to pack small orders, such as one, two and three cases without requiring you to purchase 500 of each detail from the printer, which unfortunately is the minimum quantity we can print and supply, would certainly be a big consideration for you to enjoy and a blessing to the printer. The jobber could charge a proportionate rate of the cost per thousand, plus the postage necessary to prepay mail delivery, and could save you considerable trouble and bookkeeping by deducting these charges from his settlement for the goods. We hope you will do your utmost to aid us in advancing these ideas if you feel they are of mutual benefit.

As a closing thought, permit me to advance for your further consideration a line of suggestions that will make our commercial relationship more cordial and satisfactory under existing conditions. Where we are able to get into personal touch with our trade we have been able to get attention on the prompt ordering of special packing. We have tried to educate manufacturers to order immediately upon receipt of an order for goods such packing as they will use, and not to wait until these goods are made, dyed and finished and ready for delivery before thinking of these details. A trial along these lines will convince you that it will save many a delay in our delivery, and possibly chances of cancellation from this cause, as the printer will then have ample time to prepare his part and have made delivery in advance of your needs. Many orders are also sent to the printer in an unintelligible manner. In ordering, be careful to give all the details you can; particularly the style of goods; whether Men's, Ladies', Children's or Infants'; quantity in box; and it will many times enable the printer to make you immediate delivery. A sample if possible is always acceptable. My firm has by actual inventory a stock on hand to the amount of over $14,000, and yet it is rarely possible for us to handle orders so as to ship from this stock.

The plan I have suggested above of a simplified series of labels would allow all of we printers to make a try to carry a complete line of labels and we could in time possibly arrange to do so.

I trust this paper may at least serve to simplify many of the conditions that have in the past existed between you and your printer, and I feel assuredly safe in saying for my fellow competitors, that they will all greatly aporeciate any action you may develop for the general benefit of our trade.

After the address of Mr. Smith the chairman of the Resolution Committee made an official report which was in the nature of a protest against the present methods employed by jobbers in ordering special bands and labels. As a result of which a formal resolution was made that hereafter jobbers were to supply all bands and labels for special packing. In discussing this resolution Mr. Smith who made the address on this subject arose to say that in behalf of the printers and manufacturers of these special bands and labels, he would most heartily endorse this resolution. Action was then taken and the resolution was adopted by the Association to go into effect immediately.

The introductory remarks of President Andrews justified the manufacturers in expecting from S. R. Latshaw a very interesting address, and they were not disappointed. Mr. Latshaw spoke without notes and held the closest attention of his audience. He did not mince words and his points told. The textile trade has come to realize that Mr. Latshaw understands the relation of advertising to textile merchandising better probably than anyone else in this country. He has specialized on this subject, he knows the selling problems of the manufacturers better than they know them themselves, and the change in selling methods which has been successfully made by a number of manufacturers in the last few years is largely along lines that he has recommended. The enthusiastic applause with which his remarks were received and the comments afterwards showed that the attitude of manufacturers today has undergone a remarkable change in the last few years towards the subject of advertising as an adjunct to textile merchandizing. This address will be published in full in our next issue.

George M. Loggie, the treasurer of the Kinkead Mfg. Co. of Boston, Mass., was the

next speaker. He handled his subject in an interesting way, and with much tact, pointing out the manufacturers' power losses which were possible to avoid, and alluding to the experiences of knit goods and textile manufacturers who had accomplished important savings and improved the efficiency of their plants by scientific methods of lining up shafting.

A FORWARD STEP — SCIENTIFIC SHOP ADJUSTMENT AND ITS RESULTS

By GEORGE W. LOGGIE, Kinkead Mfg. Co., Boston, Mass.

We present to you this morning some carefully gathered facts, and results of a thorough and scientific investigation covering a period of two years, and in the gathering of which facts 518 mills are involved. This is the most thorough and comprehensive investigation of the question of power lost in transmission due to line shaft friction, ever presented. With these facts I wish to demonstrate to you three propositions, and then state in a few simple words the conclusion.

The first proposition is, that in the average plant there is a preventable waste of power and efficiency, which can be traced directly to badly lined shafting. In discussing this subject with a superintendent a short time ago, he made this remark, "Line shaft friction is a necessary evil, which is always with us. We try to line our shaft as near as possible, and let it go at that. Perfect alignment is impossible on long lengths, and if I can keep my friction to 30 per cent., I am more than delighted." This first proposition is a trite statement, and presents a condition so common, and so quickly recognized and admitted, that we fail to be impressed by its real significance. If I said that for every 100 horse power you generate, you use only 85, that 85 horse power ought and will do the work that you are now using 100 horse power for, and that the other 15 horse power is simply disappearing into space, from which you are getting no real return or benefit, and I add the positive assurance that the 15 horse power could be conserved, then this first proposition would not seem so trite. If I declare also that this 15 per cent. waste is costing you anywhere from $1,500 to $3,000 a year, it would be reducing the problem to such terms that all men could understand.

Now for the facts. The lowest friction load reported from any of the over 500 mills above referred to was 29 1/2 per cent., the highest friction load was 64 per cent., that is anywhere from 29 1/2 per cent. to 64 per cent. in any of these 500 plants was wasted in transmission, and never reached the point where it was needed. The average lost efficiency in these plants was a little over 36 per cent. In knitting mills the average loss is a little less than 35 per cent., running anywhere from 30 to 44 per cent. In other words, of every 100 horse power the average is 35 horse power, and mark you, we make the positive statement, over 50 per cent. of this loss is due directly to badly aligned shafting. It is not a question of lubricant, or of this box or hanger, or that box or hanger, this bearing or that bearing, but one entirely of alignment. Please do not misunderstand me, for I do not mean to say that the lubricant does not affect the friction load, nor do I say that there are no hangers on the market which do not materially affect the friction load, but I do say that the fundamental problem is one of alignment and not one of bearing or lubricant.

REDUCTION IN FRICTION

Now, let me again refer to the superintendent, whom I quoted, in the early part of this paper. The same superintendent recently wrote me a very nice letter, in which he said: "To say that we are pleased with your method of aligning and leveling shafting would be putting it mildly. We believed our shafting was kept in as perfect alignment as possible, without the use of your outfit, but since we have started to use this tool, we are convinced that every mill in this country not equipped with a similar device is losing power by shafting friction. I am pleased to report that we cut our friction load about 38 per cent. Formerly our friction load was 32 per cent., and we have reduced it to 20 per cent., a saving of 12 per cent. on our total load." Now, let me say positively that this is not an unusual experience, and I believe states clearly, thoroughly and swiftly the real facts, and leads me to my second proposition, which is this.

SAVING BY PERFECT ALIGNMENT

A perfectly aligned shaft does reduce power, does keep friction loss to a minimum, does mean increased efficiency, and will give you a very much more even run in your factory. Here again I present positive evidence. Note this test made on a shafting 110 ft. long, size 3 5/16ths. The reading showed a consumption of 10 horse power. Competent millwrights aligned this shafting, using the old method of grass, string and carpenter's level. A second reading showed improved alignment, and a reduction of 2 1/2 horse power, the shaft consuming 7 1/2 horse power. The shaft was immediately aligned and leveled with the instrument to which I refer, and a third reading showed the shafting consuming 4 horse power, an additional saving of 3 1/2 horse power. Now note the significance of this test. The difference between an approximately aligned shaft and a perfectly aligned shaft, using the same bearings and the same lubricant, was just 3 1/2 horse power, on a shafting of practically 100 ft. in length, the size approximately 3 in. Note again, please, a plant having 2,500 ft. of shafting aligned within 60 days, friction load reported "normal" 35 per cent., total friction load 113 horse power. The shafting was put in perfect alignment according to the new scientific method, and an immediate improvement was noted. A reduction of 23 horse power from the friction, and the percentage immediately reduced to 22.3 per cent. Again, a plant, and all these plants by the way are textile plants, running 33,000 ft. of shafting and the test showed a reduction of 45 horse power.

Now, I might present test after test, which

would simply pile up the evidence, but I think I have proven the proposition that a perfectly aligned shaft will save you or any manufacturer at least 10 per cent. of your power, and the average saving is very much greater than that.

I quote from another superintendent, who says: "We have used your system of aligning and leveling shafting with entire satisfaction. We consider it the best investment we have made in some time. In one room alone we saved 20 horse power." In passing I wish to quote from a silk mill in Connecticut which comments on the question of an even run. This silk mill was having, as they felt, too many breakages, and started an investigation to detect if possible the cause, and they were driven to the conclusion that the run was irregular. After making several tests it was borne in on them that the shafting was responsible for the condition. We were called in to assist. We immediately started surveying the plant and correcting the adjustments, beginning with the shafting, and this remarkable fact presents itself, that going over the shafting and placing it in perfect condition alone resulted in the diminishing and reducing of the breakages 75 per cent.

PERFECT ADJUSTMENT POSSIBLE

Now, for my third proposition, which is this. There is a method by means of which any line of shafting, however situated, whether one size or many sizes can be put in absolutely perfect adjustment, so that there will be no variation whatsoever, between the boxes, and no friction whatsoever, other than the weight of the shafting in the box. We quote from J. O. Wells of Cooper, Wells & Co., St. Joseph, Mich.: "We have completed the lining up of every shaft in our mill with your tool, and while we did not find any of the shafts very badly out of line and level, we were really surprised to find them out of line at all, as only a couple of months ago we lined up all our shafts with an apparatus of our own, which we considered very accurate. But we are now willing to admit that your apparatus is the most accurate and practical of any that we have ever seen. We know positively when we get through with your apparatus that it is in line to a hair's breadth."

Here is a testimonial from a knitting mill in Fort Wayne, Ind.: "Your apparatus gives absolutely perfect results. In some cases we have been able to reduce our line shaft load as much as 25 per cent."

Another mill treasurer writes: "We have thoroughly tested your machine and find that it gives absolutely accurate results."

Gentlemen: The question of line shaft friction, and how to keep our transmission in good condition is no longer that troublesome and ever present problem affecting fundamentally the whole question of mill operation, for we have at last a scientific method of doing this work which eliminates once and for all the fine grass or silk line and carpenter's level, together with the artistic dodging of this work on the part of a tired millwright. No building of staging, no setting of targets, no removing of belts, and I will go further and say, no more shut downs for the purpose of lining up shafting, no more crystalization and breaks, and it ought to mean the immediate and final elimination of the preventable loss of power, which has cost us so much in the past.

ACCURACY PAYS WELL

Now, for the conclusion, it pays and pays well to keep your shafting in perfect condition, and to do so, shafting ought to be gone over much more frequently than once a year. Second, with the scientific method of doing this work you can line up your shafting day or night, whether the shafting is running or still, however situated, without moving a belt or removing an obstruction and bring that shafting to an absolutely perfect line as regards both level and alignment. This can be done quickly, so quickly that a noon hour will enable you to put almost any shafting in your plant in perfect condition. The method is so simple that it will save you time, power and labor. Thirdly, any plant is materially affected, both in efficiency and economy, by failing to apply this scientific method to the problem.

I appreciate this morning that I have made some strong statements, I have presented you quotations, and at the risk of laying myself open to criticism, I can simply say in closing that I shall be most happy to visit any mill anywhere and prove by actual demonstration and actual test every statement that I have made. I think it is only fair that I should say frankly that the tool to which I have reference is that of the Kinkead device, for I believe honestly that I am doing you a service and every mill in this country a service by presenting to you the result of an extensive, conscientious and thorough investigation on this point, which investigation was actuated at first by selfish motives, impelled by a conviction that in my own plant I was wasting power and money and the conviction that a method could be devised which would eliminate such waste.

At the session on Thursday morning a valuable technical address was read by H. F. Hoffer entitled The Basic Quality of Silk and Its Full Value. The merits of the address entitle it to be printed in full, and we delay its publication till our June issue that we may give it the space it deserves.

The report of the resolutions committee and other committees were read and adopted. The changes in the constitution recommended by the executive committee were approved.

ELECTION OF OFFICERS

The election of officers resulted as follows:—

Chas. E. Leippe, President, Reading Knitting Mills, Reading, Pa.

Edward Blood, Sr., 1st Vice-President, John Blood & Bro., Phila.

T. H. Johnston, 2nd Vice-President, Knoxville Knitting Mills, Knoxville, Tenn.

C. B. Carter, Secretary.
Robert C. Blood, Treasurer, John Blood & Co., Phila.

BOARD OF DIRECTORS

S. D. Bausher, Gotham Underwear Co., Hamburg, Pa.
D. L. Galbraith, World's Star Knitting Co., Bay City, Mich.
W. Park Moore, Brown Knitting Co., Phila.

RESOLUTIONS.

Resolved: That we urge upon each and every member of the Knitting Industry to unite with us and assist in pushing forward to a full and complete growth The National Association of Hosiery and Underwear Manufacturers.

Whereas: So many of our members have found the purchase of cotton yarns upon the net weight basis of so great advantage over the old method of buying upon the 2 per cent. allowance basis, and the number of knitting manufacturers who demand and receive net weight terms is constantly increasing.

Be it Resolved: That we impress upon all members who are not now buying yarns on the net weight basis to adopt this plan, and as a means of impressing upon them the importance of these terms, we recommend that they adopt the system prepared by the Association of keeping accurate yarn records.

Whereas: The continued operation of the Credit Bureau Department of the National Association of Hosiery & Underwear Manufacturers has more fully demonstrated the efficiency of this system for the mutual protection and advantage of the members of our Association. Be it resolved that we commend very highly the methods pursued in securing the results that have been achieved, and that the Secretary be instructed to make every possible effort to enlist the cooperation and support, not only of all members who have not joined in this work, but also endeavor to secure the memberships of all knitting manufacturers not now members of the association.

Whereas Hosiery and underwear manufacturers under present conditions are put to a great deal of expense and annoyance in not being able to get bands and labels and special packing in a reasonable time on account of the small size of the orders at a price that will not allow the manufacturers a profit, and as this is a condition that seems to be growing worse from year to year, now be it

Resolved: That the hosiery and underwear manufacturers assembled in convention protest against further continuance of these conditions to the end that manufacturers notify selling agents to work in conjunction with them and request jobbers in accepting new orders to furnish all their own bands and labels to the manufacturers at cost to jobbers plus postage; that the president appoint a committee to act in conjunction with the secretary and address a letter to every jobber in the United States asking his cooperation and pointing out the advantages to the jobbers of such a course.

UNDERWEAR MANUFACTURERS MEET

Twenty-one mills were represented at the meeting of the Knit Goods Manufacturers' Association at its seventh annual meeting at the Ten Eyck Hotel in Albany, N. Y., on May 8th. The annual reports of the various committees were presented. John K. Stewart reported the progress of the tariff committee relative to gathering statistics, which will be presented before a committee in Washington, should a hearing be given to the manufacturers. John R. Blood, Amsterdam, was elected president; John K. Stewart, of Amsterdam, first vice president; George A. Clark, Warsaw, second vice president; F. B. Harden, Philmont, third vice president; J. H. Reaney, Hudson, fourth vice president; Thomas R. Bailey, Fort Plain, fifth vice president; B. M. Crouse, Utica, treasurer; W. H. Morton, Utica, secretary. An executive committee was appointed composed of G. M. Treaber, Perry; W. D. Mahony, Troy; H. S. McElwain, Johnstown; W. W. Briggs, Johnstown; Andrew Frey, Utica; David Williams, Little Falls; Q. McAdam, Utica; Arnold F. Hatch, Albany, and Eugene West, Syracuse.

SOUTHERN NEW ENGLAND TEXTILE CLUB

The next meeting of this organization is on the 4th Saturday of the month, and will be held on the 25th of May at the request of the New Bedford committee, who have made elaborate arrangements for the entertainment of the club. The Wamsutta Club, Dartmouth Club, New Bedford Yacht Club, Country Club, New Bedford Textile School, have extended the courtesies to visiting members. Dinner will probably be served at Odd Fellows Hall in New Bedford.

The Philadelphia Knitting Machinery Exhibition.

It was the opinion on the part of the manufacturers and exhibitors alike, that this exhibition of knitting and auxiliary machines and supplies was the best ever given under the auspices of the National Association of Hosiery and Underwear Manufacturers. Early in the year it was seen that the number of applications would exceed the capacity of Horticultural Hall, where the exhibits have been held for several years past and so the First Regiment Armory was engaged and the entire space was sold. The experience of past years has enabled the management to conduct these exhibitions with system and convenience to the exhibitors and to the public.

The general scheme of decoration was attractive and harmonious. Green and gold were the basic colors on the walls while flags and bunting adorned the columns, galleries and the ceiling. The exhibitors' signs were in green and gold of a uniform pattern, which added to the scheme of decoration. White railings and many rugs on the floors of the booths gave a finish to the hall.

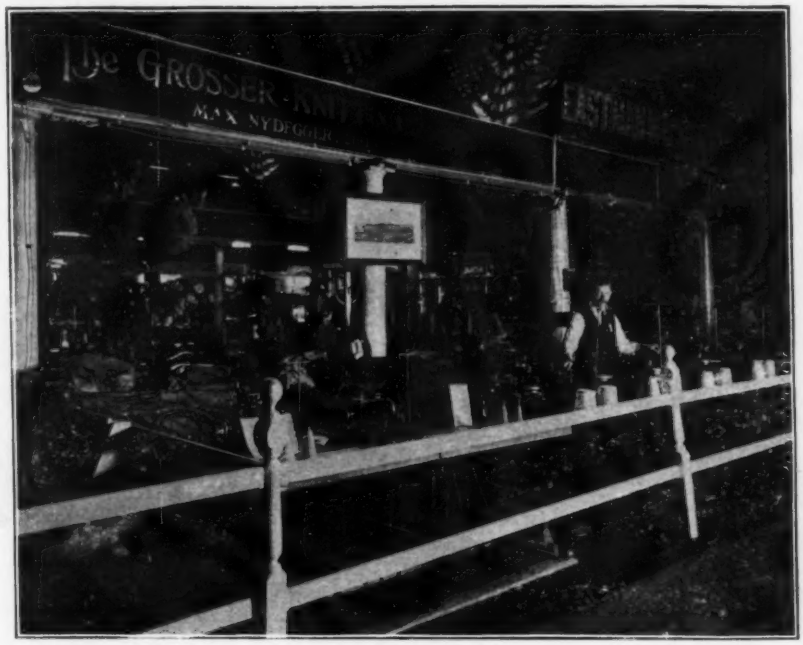
We do not recall an exhibition where there have been so many novelties in the way of machinery to interest the visitors and they were keen to inspect the new things that in many instances were shown for the first time. The exhibitors almost without exception, reported themselves well satisfied with the results from a business point of view. Many orders were placed and more prospects were developed. It is safe to say, that no exhibition has ever attracted a larger number of knitting manufacturers from all over the country and brought out such a large number of mill men.

SCOTT & WILLIAMS, INC. AND GEO. D. MAYO MACHINE CO.

To describe in full detail all the exhibits would far exceed the limits of this issue, but we present and illustrate the principal features of the different exhibits in this attractive show.

The Grosser Knitting Machine Co., Max Nydegger, New York, occupied a large space near the center of the hall. This concern had the reputation of large and successful exhibits at previous exhibitions to live up to, and they certainly

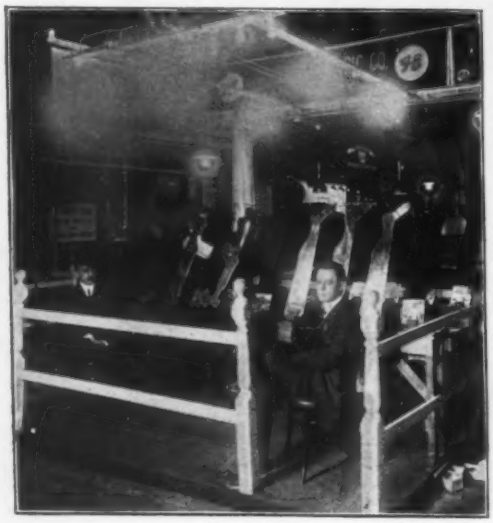
did not fall below the high standard of the past with this year's exhibit. Manufacturers of fancy knit goods and sweaters were particularly interested in the new machine which produces a full fashioned shaker garment in one piece with the pockets already knit in. Loopers and seamers for seamless and fashioned hosiery, underwear, and sweaters, were shown in full operation. Other machines shown were producing an interesting variety of fancy stitches and various designs for all sorts of garments. A flat knitting machine for neckties was shown. Max Nydegger was personally in attendance during the week, assisted by Robert Winkler and others of their staff. These gentlemen are practical men themselves and many manufacturers took advantage of the opportunity, not only to inquire as to the working of the machines that were exhibited, but to discuss with them the most practical and up-to-date methods of manufacture of the novelties which the market demands, and for which they supply the machinery and of which they had samples on hand to show.



THE GROSSER KNITTING MACHINE CO.

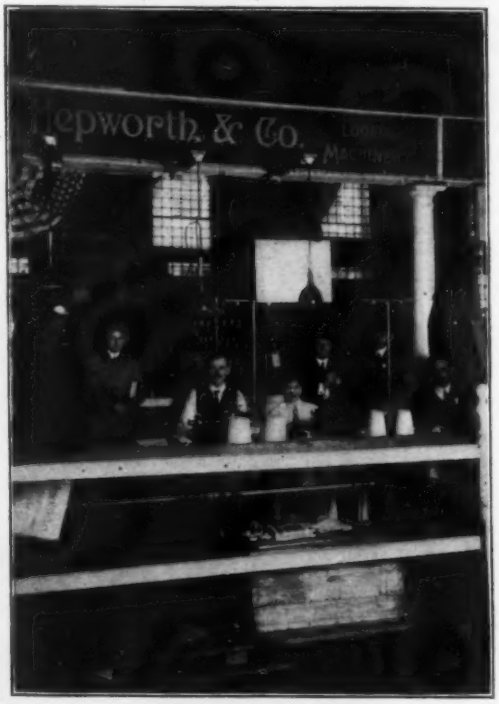
The Scott & Williams, Inc., together with the Geo. D. Mayo Machine Co. showed a large number of underwear and hosiery machines in operation. For underwear machinery they showed a Fourteen to One—Swiss Rib Shirt Machine of their standard pattern for ladies' fine underwear; a Fourteen to One —1 by 1 shirt machine for fine gauge men's and women's underwear; a Sixteen to One —1 by 1 shirt machine for light weight men's and women's underwear. This machine is believed to be the finest gauge, latch needle machine ever built and through a special and ingenious arrangement of jacks, it is able to handle an extremely light weight yarn and produce a fabric that heretofore could not be made commercially. They also showed a multiple head tape machine for producing tubular tape or banding now so popular for trimming ladies' underwear. In this machine six heads are mounted on one frame, and by a special arrangement of driving pulleys and special design of cylinder, this machine can be run very much faster than the type of tape machine heretofore used. One six-head machine was said

to produce as many yards of tape as 20 machines of the single head type. In hosiery machinery, in addition to their automatic half-hose machine, so long and favorably known, and their standard line of hosiery ribbers, the Geo. D. Mayo Machine Co., who are associated with Scott & Williams, Inc., exhibited several new types of machines. The complete line comprises the well known Mayo Model A of which it is said that there are more machines in operation than any other make. The Model B machine, which is of the revolving cylinder type and is fitted with the well known Scott & Williams inserted wall cylinder, being especially designed for yarn changing, plaiting and so



GENERAL ELECTRIC CO.

forth, and especially adapted therefore to light weight silk and silk plaited hosiery now in such demand. The Mayo Model C is built on the stationary needle cylinder principle and is similar to the Model A. This machine, however, is equipped with the Scott & Williams inserted wall cylinder and is especially adapted for fine gauge work. This machine is also arranged when desired with two cylinders and a special device by means of which cylinders can be removed or interchanged with the greatest ease. It is, therefore, especially adapted for transferring directly on the cylinder needles without the use of a point ring. Among the interesting new features shown in this exhibit was a device for preventing "Jacob's Ladder" or the running of stitches due to a garter tear. The product of this device which can be at-



JOHN W. HEPWORTH & CO.

tached to both Model B and C machines is protected by patents owned by the Company. In all these machines all wearing parts are interchangeable. Among the other interesting features of this exhibit was a Scott & Williams No. 1 machine, which was brought out by this concern in 1890 and one of the earliest machines ever built which made the heels and toes automatically. This machine was operating, producing stockings which, considering their gauge, compared favorably with the product of machines built today.

The General Electric Company had a particularly interesting exhibit, one special feature being the new color matching outfit, which was shown at the Boston Textile Exhibition, and described elsewhere. It pro-

duces a light similar to that from a clean north sky. Another feature which attracted much attention were the electrically heated hosiery drying boards which are described at length on page 323 of this issue. Other specialties shown were electrically heated flat irons for pressing, transferring stamps, etc. Disk stoves in several sizes were shown suitable for heating sizing, starches, etc.; also aluminum and water jacketed types of glue pots; small reostats, and a 10 h. p. 220 volt motor. The advantage of electrically heated devices is being generally recognized by manufactruers, and the General Electric Company has in recent years brought out devices suitable to all branches and purposes. Many of the exhibits in the show were operated by General Electric motors.

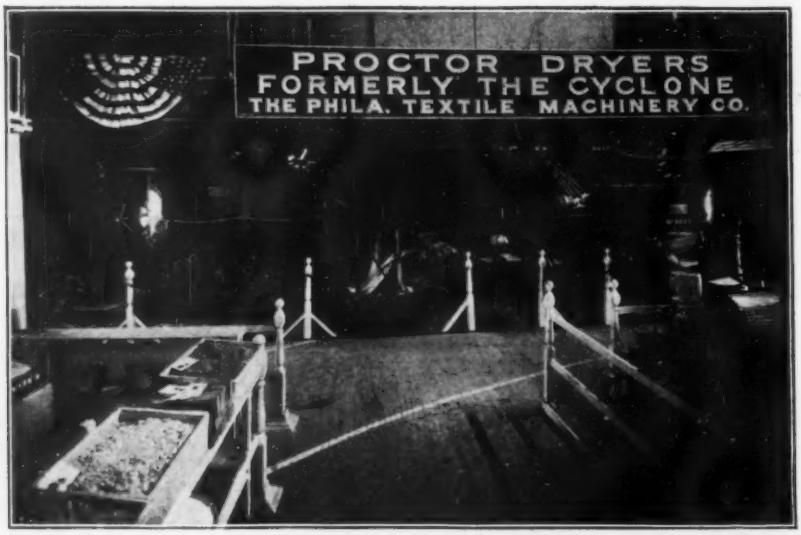
H. BRINTON & CO.

John W. Hepworth & Co. exhibited one of their 20-point "old" style loopers, with improved attachment for making elastic stitch, and a 22-point "new" style two-thread elastic lock stitch looper recently described at length in this magazine, both machines having trimmers attached. No machinery builder in the trade is better known than Mr. Hepworth and his booth was always surrounded by manufacturer friends who were interested in seeing the new looper and shaking hands with the head of the concern.

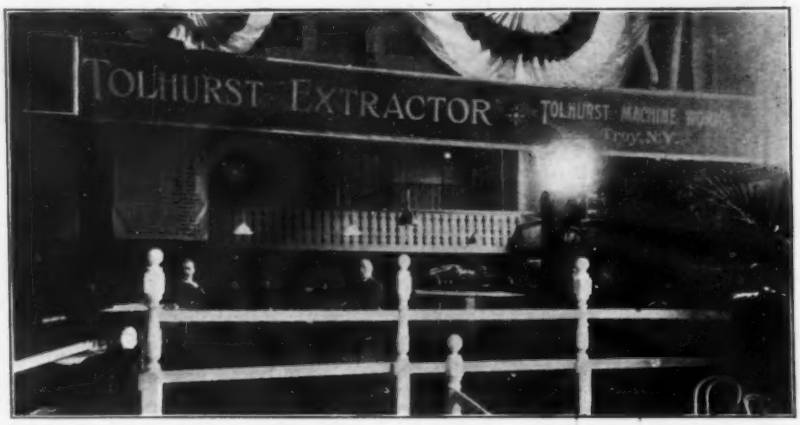
The H. Brinton Co., 213-17 Race St., Philadelphia, exhibited two knitting machines for making neckties, one with the regular two-color yarn changer and the other for making four color effects. They also showed a single feed automatic ribber for making half hose tops with two speed and selvedge welt attachment, the exhibition being nuder the supervision of Harry Klockner and H. S. Horrocks.

George C. Decker, of 17 South 3rd St., Philadelphia, exhibited two different types of the Bradley stencil machines, one a flat machine and the other a round machine; also a line of supplies for shipping departments including stencil filing cabinets.

The Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Philadelphia, with Mr. Kershaw, head of sales department and a staff of experienced mechanics in charge, exhibited many improvements in drying machines for hosiery and underwear. Their exhibit consisted of the following machines: a Proctor automatic loop dryer for drying underwear in the string; two Proctor stocking dryers, one direct connected with motor, showing new style pin rails, the other being a belt driven machine for the same purpose. They also showed a new style heel rest for use on fine hosiery. Their large space was the first on the right as one entered the hall and attracted much attention. It was most attractively decorated, and across the front a big electric sign in red and green flashing out the name caught the eye from every part of the hall.



THE PHILADELPHIA TEXTILE MACHINERY CO.



TOLHURST MACHINE WORKS.

The Tolhurst Machine Works, Troy, N. Y., exhibited a new open top extractor, for which a patent has recently been issued. It has some novel features. The case is supported on concave step cups, the arrangement being such that the supports are entirely under the case and out of the operator's way. A positive flow of oil is secured by means of a centrifugal pump which works whether the extractor runs right handed or left handed. The machine shown was of the belt driven type operated by motor. The driving gear of other types of their machines was shown, illustrating how the extractor may be driven either by motor attached directly to the extractor spindle, or by engine attached in the same way. F. A. Tolhurst and E. W. Vincent were in charge.

PAXTON & O'NEIL.

Paxton & O'Neil of Philadelphia, showed their full automatic yarn changer knitting machines making silk and plated hose and half hose. These machines show the latest improvements in the mechanism for making these goods in the finest gauges, for which this company makes a specialty. They were noticeable not only for the fineness of the fabric made on latch needle machines, but for the smoothness of operation and accessibility of the parts for adjustment. Mr. Jackson, the sales manager, was in charge of the exhibit, with several assistants and Mr. Paxton was often at the booth to meet his friends.

Aberfoyle Manufacturing Co., Chester, Pa., mercerizers of cotton skein yarns, furnished their booth as a reception room for their customers and other visitors. E. A. Snyder, their sales agent in Philadelphia, and other representatives, were on hand to entertain their friends.

The Wildman Manufacturing Co., Norristown, Conn., exhibited one of their new necktie machines, which has recently been described and illustrated in the Textile World Record. It has a wide range of work and the special feature of the dogless attachment, which prevents dog streaks and insures accuracy of the dial and ease of adjustment. The French welt machine which they showed also has the dogless attachment with various automatic changes and a two speed drive, so combined as to produce a superior cuff. The Swiss rib body machine has improved yarn guides and cylinder cams, the combined gravity and positive takeup; hardened and ground dial system, cylinder and dial and other refinements. The machine for making cord for caps, lumbermen's socks, mittens, etc., was an interesting knitting machine novelty. The Ballard electric cutting machine was also exhibited and practically demonstrated.

The Kilbourn Manufacturing Corporation of Brunswick, N. J., showed their automatic rib topping machine which was exhibited for the first time at the last exhibition, and attracted much attention. It automatically transfers the stitches of hosiery rib tops to the quills of transfer cups, cutting the ribs apart and delivering them topped on the points of the transfer ring ready for transferring to the needles of the knitting machine. It works in connection with the old style knitting and ribbing machines, requiring only a few slight attachments to the ribber and a particular kind of transfer cup. This machine is built in various gauges from 188 N down.

THE WILDMAN MANUFACTURING CO.

The New York Revolving Portable Elevator Co. of Jersey City, had a similar exhibit to the one at the Boston Show, of which a picture is printed on another page. The revolving base is a feature of special importance.

The Beattie Manufacturing Company, Cohoes, N. Y., exhibited several of their new Nonpareil two thread loopers. This looper is especially interesting to those who have other makes of loopers, which they wish to convert into the two thread type without going to the expense of purchasing new loopers. The Nonpareil has no cams or springs, using eccentrics exclusively. It uses the curved needle. The Company supplies the new looper complete or the attachments for changing over the old styled looper into the two thread type. Wm. Beattie, the head of the company, was in attendance at the exhibit during the week, with W. Jos. Harrison, the Philadelphia agent, in charge.

THE BEATTIE MANUFACTURING CO.

Louis Hirsch, 260-262 W. Broadway, New York, representing Alban Ludwig, builder of full fashioned hosiery and underwear machines of Chemnitz, Saxony, fitted up a space most attractively, in which he received many visitors and explained to them the features of his full fashioned machinery, a class of machines which it was impossible to erect and have in operation at the Exhibition.

The Universal Winding Co. of Boston showed two gangs of their No. 50 Nutaper coning machines, equipped with motor drive, which were in operation winding regular sized cones, and also winding the small cones of fine yarn used for reinforcing for the soles of socks; a No. 90 machine shown in practical mill operation on shuttle bobbins, and also winding yarn on large sized bobbins for use on knitting machines. This bottle-shaped bobbin is a new development of the No. 90 machine, and attracts much attention from the knitters of full-fashioned hosiery. A fine display of mercerized yarn in colors on Nutaper cones was made. The exhibit was in charge of Frederick H. Bishop, assisted by F. J. Quinn, the Philadelphia

Agent of the Company. The machines were kept busy most of the time rewinding cones for knitting machines shown by exhibitors.

T. J. Porter & Sons, 119 S. 4th St., Philadelphia, with J. A. S. and W. H. Porter in charge, exhibited a line of mercerized cotton

T. J. PORTER & SONS.

yarns manufactured by Robert Marsland & Co., Ltd., fine cotton spinners and doublers of Manchester, Eng.; and linen yarns spun by Lindsay Thompson & Co., Ltd., of Belfast, Ireland. The booth contained knitting machines, supplied by the Standard Machine Co., which were operated on 220 needles hosiery, using yarns from 30s to 160s and linen yarns in various numbers for splicing heels and toes. The exhibit consisted of cotton yarns in cones and skeins, a sample of fine mercerized 2/300 on small cones being handed to the visitors as a souvenir of the occasion. It is said that this is the first time a mercerized yarn of this count has been spun and offered for sale in this country.

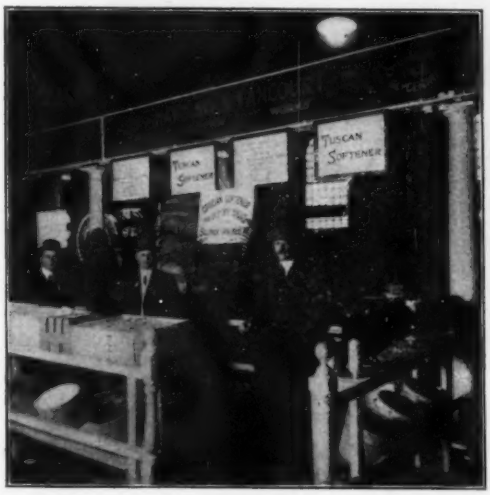
The Meyercord Company of Chicago and Philadelphia, through their Philadelphia Office, of which H. A. Meyercord is the manager, displayed an assortment of advertising signs and decalcomania products, for clothing, hosiery and underwear manufacturers.

One of the new things which attracted attention from the hosiery trade, was a practical demonstration of the "Hollow Metal Hose Board," now being introduced by W. D. Butz, sole selling agent with offices at 625 Bourse Bldg., Philadelphia. The visitors at the booth were shown why and how they could finish their hosiery without the use of a dry box, the booth being equipped with boards for both ladies' and half hose. Mr. Butz also showed the "Universal" hosiery welt folder, a new and practical device for producing straight and sewed welts of even and regular lengths on hosiery.

W. D. BUTZ.

Ainslie Knitting Machine Co., Brooklyn, showed a Shaker machine of Claes & Flentje make with 60 inch single needle bed; a Shaker sleever with a 14 inch needle bed. They also had in operation a flat necktie machine, 18 inch gauge, 8 lock system with supplies, etc., for knitting mills.

The Rose Label Machine Co., Grand Rapids, Mich., exhibited a new model of their improved label sewer, which automatically attaches labels of any character on any kind of goods where a square or oblong line of stitching is required. This ingenious machine sews around four sides as fast as a plain sewer will do the same length in a straight line, doing this without turning the goods or stopping at the corners. They showed a machine for both the clothing and the knit goods trade. These two machines cover any class of garments on which labels are used. They also showed the Rose Automatic Label Cutter and Folder, which cuts and folds labels as neatly as can be done by hand, at the rate of 40 to 60 labels a minute. The Exhibit was under the personal charge of Arthur Rosenthal, the president of the Company.



HARDING & FANCOURT.

Harding & Fancourt, Inc., 516 S. Delaware Ave., Philadelphia, exhibited the well known brand of "Tuscan" softener, "cream" softener, German castor oil, soaps, olive oil, etc. This concern has recently installed in their new plant a drying machine for making bone dry Shredded Soaps, the soap being absolutely dry and uniform both in composition and quality. Both Mr. Harding and Mr. Fancourt were on hand to receive their many customers and to explain to others the merits of their goods.

THE ROSE LABEL MACHINE CO.

The "New" Branson Machine Co., Philadelphia, builders of knitting machinery, used their space as a reception room for their friends.

The O. F. Zurn Company of Philadelphia exhibited a large line of cotton and silk softeners and finishing specialties for the hosiery and knit goods trade. They gave special prominence to what they called the "New 1912 Softener" for either sulphur or aniline process; also specialties for silk knitting. John M. Zurn, president of the company; J. L. Wilson, manager, and H. B. McKinley, were in attendance to welcome visitors.

The Philadelphia Drying Machinery Co. of Philadelphia, occupied a large space opposite the end of the center aisle, where they showed their line of machinery embodying some interesting features which have been developed during the past year. Their dyeing machine for hosiery and yarn has been still further perfected to secure not only more perfect results in dyeing developed sulphur black and colors, but also eliminating the necessity of using high priced attendants.

THE PHILADELPHIA DRYING MACHINERY CO.

The automatic singeing machine has been still further developed, and this year's model was inspected with much interest by the visitors. One of the "Hurricane" fire-proof dryers of steel construction was shown. Air-cell asbestos is placed between two layers of steel sheets which retains the heat most effectively and secures rapid and economical drying. Hot and cold plate presses of the hydraulic and power-screw type ranging in capacity from one giving a pressure of less than 100 tons up to 500 tons, are included in their line. Fans and ventilating apparatus were shown in operation. There was an interesting exhibit of photographs showing many complete finishing plants which the Philadelphia Drying Machinery Co. has installed.

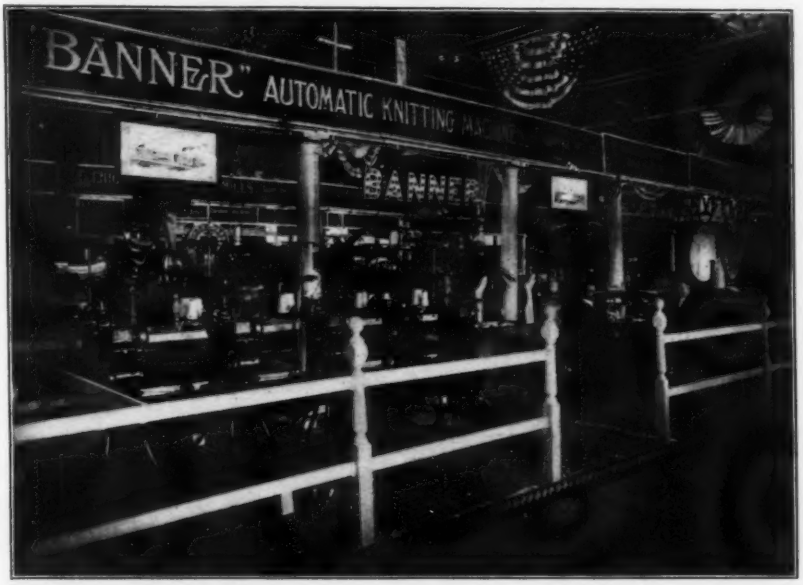
The Continental Latch Needle Co. of 120 Liberty St., New York, was represented by E. W. S. Jasper, President and General Manager of the concern They are the sole importers of the well known "Continental" needle, made by Theodor Groz & Soehne, at Ebingen, Germany. They showed a very interesting collection of samples, ranging from the heavy Shaker machine needle to the finest gauge hosiery needle used. The universal trend of the hosiery manufacturers towards making finer goods has brought about a demand for very fine gauge needles, of superior finish, a demand the Continental Latch Needle Co. is meeting with ever increasing success. Their needle has a screw rivet, perfect temper and excellent finish.

Edwin A. Newton of Philadelphia, exhibited yarn testing reels and scales, knitting machine cylinders, and dials, and other equipment for knitting mills, for which he is agent or carries in stock.

The Hemphill Mfg. Co. of Pawtucket, R. I., occupied a large space with a very attractive exhibit, which was ready for operation on Monday morning, as the Hemphill exhibits have always been in the past. They showed five of their latest machines, three on ladies' work, and two on half hose. New features and improvements to the Banner machine have made it even more efficient than in the past. The company's capacity to turn out over 70 machines a week has been taxed to its limit for several years, and they report at the present time more orders than they can take care of. A new machine which has just been completed for the popular accordion stitch was a feature of special interest. This machine is fully automatic, and so designed that it will make a number of different patterns. Other new features which have proved popular are the four change of yarn lever machine, which has been on the market for some months past; also a web takeup which is neat in design and effective for ladies' hose. John Lawson, the manager, with a number of assistants, was kept busy explaining the new features of this popular line of machinery. E. H. Sturtevant, the treasurer of the company, was present much of the time.

The Eppler Machine Works, 629 Filbert St., Philadelphia, one of the new exhibitors at the show, exhibited their improved steaming outfit for finishing knitted neckwear, and a new knitting machine for covering cords, a line of work now done by braiding machines.

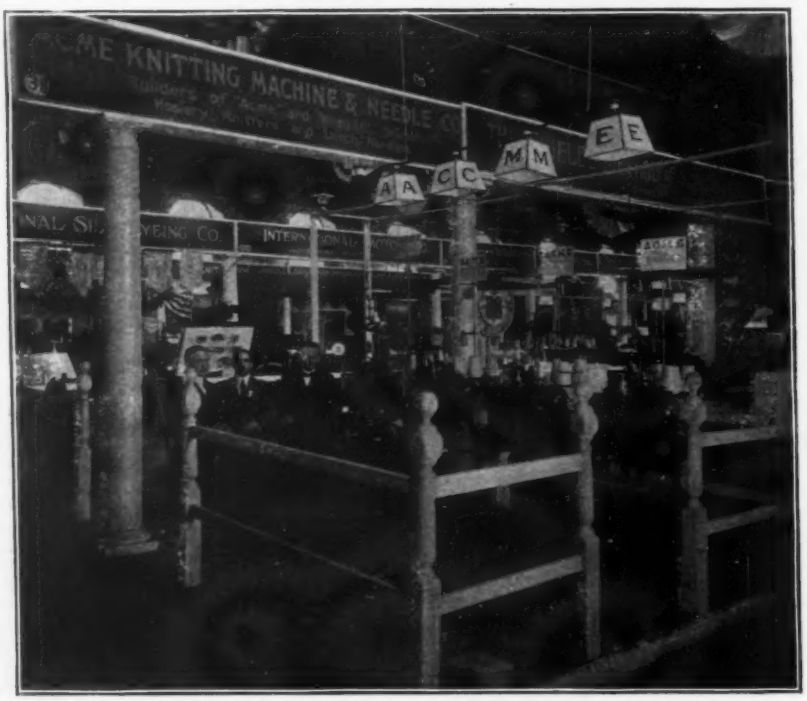
The Nonotuck Silk Co. exhibited a line of natural and spun silks for knitting and embroidery purposes.



THE HEMPHILL MANUFACTURING CO.

Palm, Fechteler & Co., 67 5th Ave., New York, exhibited a line of gold transfer stamps (Delcalcomaine process) for marking hosiery, knit neckwear and other knit goods. Among their exhibits were some very fine novelties of their own creation. Every manufacturer can have his own designs according to his ideas or the brands of goods manufactured. During the past few years this style of marking has become very popular, being easy of use and comparatively cheap. They have branch offices in Philadelphia, Chicago, St. Louis and other principal cities. Philadelphia agent R. S. Miller, 5506 Wyalussing Ave. and E. S. Tucker of New York were active in the Exhibit. J. A. L. Moller, Manager for Palm, Fechteler & Co. was in charge.

The Acme Knitting Machine Co., Franklin, N. H., through their Philadelphia Office, showed a 3 1/2 inch-220 needle knitting machine. This machine was equipped with their yarn changer and double sole for flat and artificial plaiting. They also showed a 2 inch-124 needle, 50 gauge machine for making infants' tipped cuff top socks. This machine, they claimed to be the smallest sized knitter on the market. Another machine was a 3 3/4 inch revolving needle cylinder, 220 needle machine for making half hose, a 3 1/2-260 needle machine for making ladies' hosiery. This they also claimed is one of the finest latch needle machines now being sold to the knitting trade.



ACME KNTTING MACHINE & NEEDLE CO.

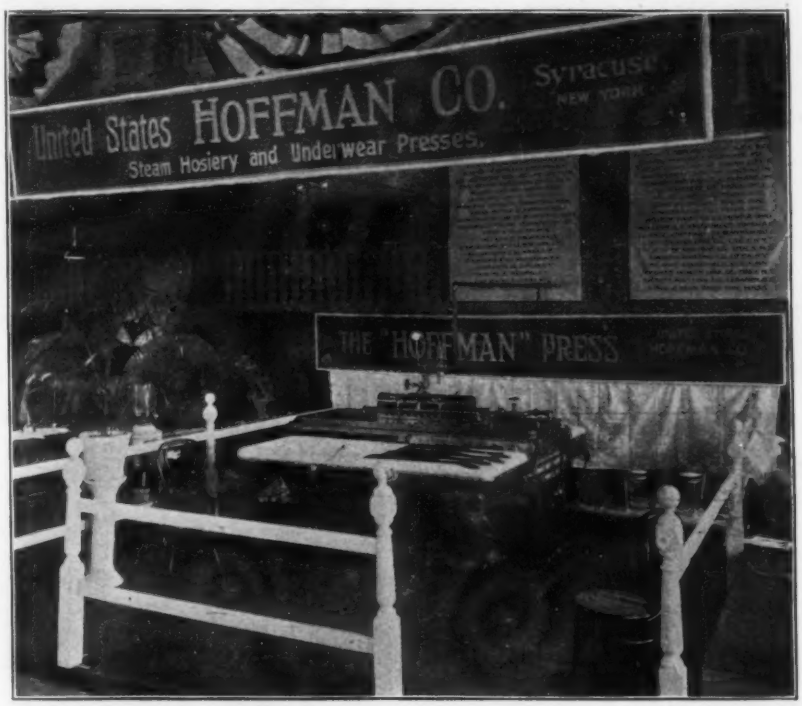
W. T. Lane & Brother of Poughkeepsie, N. Y., manufacturers of mill baskets, made a similar display to that at the Boston Show, which is illustrated and described elsewhere. They showed models of baskets which were particularly adapted for the knitting trade. Mr. Lane was present during the week.

The J. B. Ford Co., Wyandotte, Mich., transferred their exhibit from Boston to Philadelphia, in charge of F. S. Klebart, who pays special attention to the textile trade. A detailed account of this exhibit, and picture, will be found among the Boston Show notes.

Alfred Suter, of New York, importer of textile machinery and textile testing devices, transferred his interesting exhibit from the Boston Show to Philadelphia. It is described at length under the head of the Boston Convention, with an illustration of the exhibit. Mr. Suter was in personal attendance during the week, and was well pleased with the results of both exhibitions, finding the interest in textile appliances is increasing every year.

The Nicetown Dye Works, dyers of intense blacks on hosiery and yarns and bleachers of hosiery, had on exhibition samples of hosiery and yarns dyed and bleached in their plant and on which they are doing a most successful business.

The Metropolitan Sewing Machine Company, of Nyack, N. Y., showed 15 different types of finishing machines, which they build for the knit goods trade. Their newest development is the universal flat seam overstitch machine which can be changed from a narrow to a wide seam without interrupting the speed of the machine. Several lace sewers were shown, the latest model being fitted with a trimming device. Their three needle cross-stitch machine for back flap, cuff, and collarette work had never been exhibited before, and attracted much attention. They also showed a new line of toggle trimmers, one being for very heavy shaker goods. The exhibition was in charge of W. O'Donnell, manager of the Philadelphia office, assisted by R. R. Hughes, from the Nyack factory, and others of the Philadelphia staff.

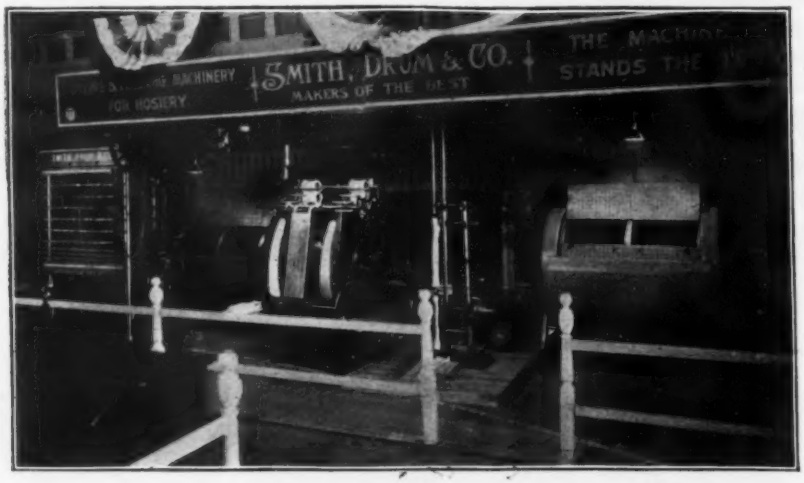


THE U. S. HOFFMAN CO.

The U. S. Hoffman Co., Syracuse, N. Y., showed in operation the "FFF" Hoff-man steam pressing machine. This machine has been described and illustrated in the columns of the Textile World Record and manufacturers had a chance to see it in practical operation. They were invited to bring samples of any kind of goods for pressing, so as to test on their own product just what this machine would do. The press is operated entirely by steam and works so easily that girls may operate it without over exertion. It gives either a high and lofty feel to the goods or a hard smooth finish according to requirements. The wall at the back of the Exhibit contained a long list of prominent manufacturers who are using the Hoffman press. C H. Lewis, the treasurer of the company, was present during the week, with several assistants. He made many friends and some good orders were closed.

The Link Belt Company, of Philadelphia and Chicago, had a similar exhibit to that in Boston, which is described in another part of this issue.

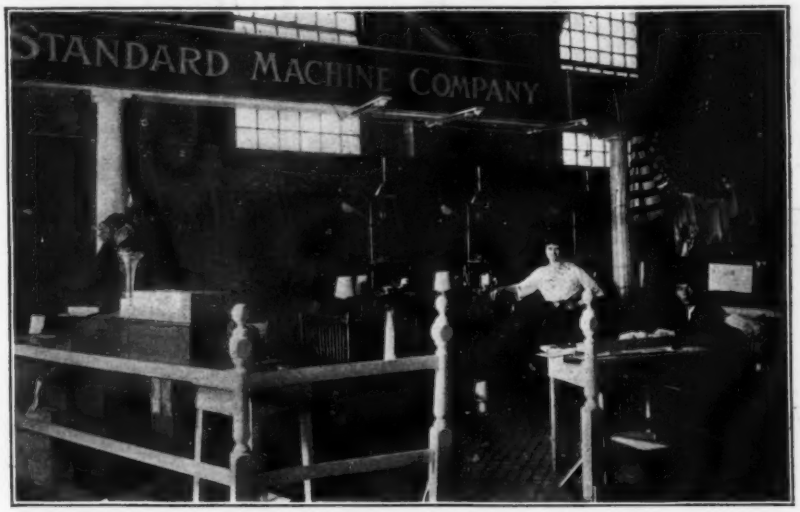
The Eastman Machine Company of Buffalo, N. Y., exhibited various types of Eastman cloth cutting machines. The type U was especially interesting to knit goods manufacturers and is the result of sixteen years' experience in the exclusive manufacture of cloth cutting machinery. Great economies have been effected by its use in knitting mills. This machine is built to operate on both 110 and 220 volt direct current. They also showed an alternating current model which will operate on the same voltages. Besides cutting machines were exhibited a full line of round knives to operate on either current.



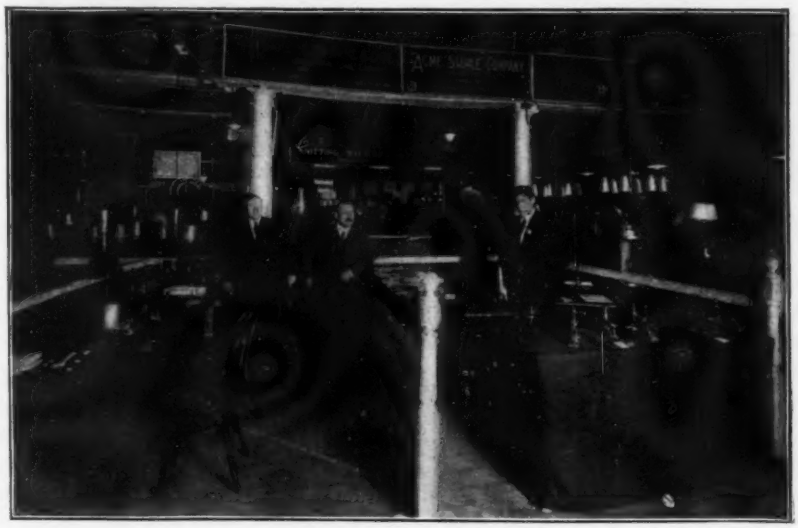
SMITH, DRUM & CO.

EASTMAN MACHINE CO.

Smith, Drum & Co., Coral and Cumberland Sts., Philadelphia, builders of machinery for dyeing, finishing and mercerizing purposes, exhibited a rotary chromer for dyeing hosiery, a rotary dyeing machine and a rotary singeing machine. They also showed one of their hot presses and the new and latest improved stocking turner. Mr. Smith, assisted by expert mechanics, demonstrated the value of the machinery for use in the knitting and textile trade. Their space was at the entrance to the Hall where their big machines attracted immediate attention.



STANDARD MACHINE CO.



EXHIBITS OF ACME STAPLE CO. AND OF C. E. HARDENBROOK, AGENT FOR THE UNION BUTTON SEWING MACHCINE CO.

The Standard Machine Co., of Philadelphia, occupied a large space in which they showed a 240-3 3/4 inch and 220-3 3/4 inch

machine for making ladies' hose and half hose, with all the latest improvements, including garter top, loose welt automatic transfer adjuster, double sole, high spliced ankle attachments and also automatic transfer adjuster for half hose. A 176-3 1/2 inch machine making ladies' ribbed goods, doubling every stitch. All these machines were equipped with their latest model 10 splicing device for handling any combinations of yarns used in the hosiery trade. The exhibition was in charge of Jacob Bauer, general manager, assisted by Chas. L. Schoneman, Western and foreign representative and P. R. Rahm, Southern representative.

MERROW MACHINE CO.

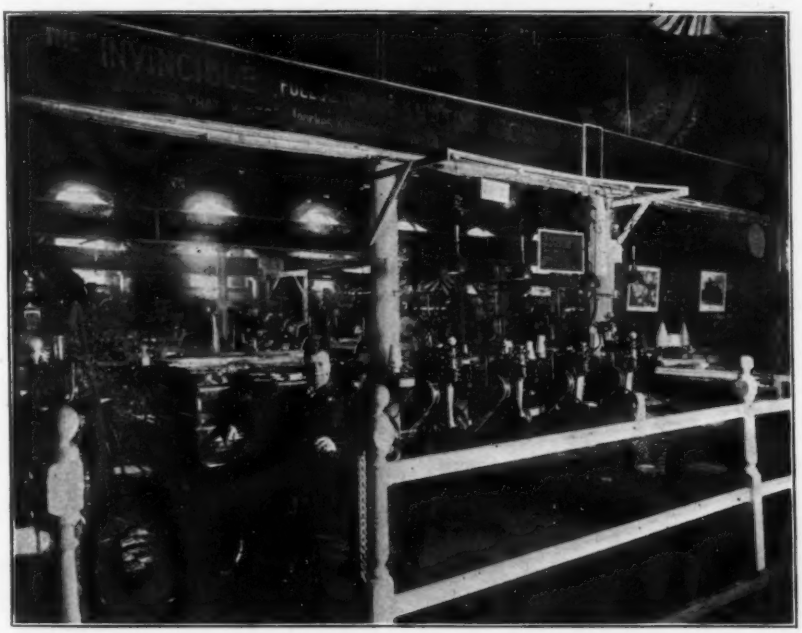
The Acme Staple Co. of Camden, N. J., exhibited a new binder, especially designed for textile and hosiery. It is a foot power machine for ticketing hosiery and other textile fabrics. It has an automatic clinch and uses a very fine wire staple, which is pointed to avoid cutting threads in the fabric. The fine wire may easily be removed without tearing or leaving a hole. They also exhibited a line of machines for swatch and sample purposes, together with machines for office binding and filing. A demonstrator was in attendance to show the working of the various devices.

C. E. Hardenbrook Co., 44 N. 4th St., Philadelphia, showed sewing machines built by the Union Button Sewing Machine Co., of Boston, for which they are the agents. This machine not only sews on all sizes of shank buttons on sweaters and sweater coats and underwear, but cloth covered buttons as well; tieing a series of knots in the end of the thread, preventing raveling and severs the thread between button and fabric. The Exhibit included the new "End On" type of elastic stitch button sewing machine, recently produced by the same company.

The Merrow Machine Co., Hartford, Conn., showed a line of their finishing and auxiliary machines. New models of their overseaming and shell stitch machines were on exhibition, and a hemmer. They also showed a new stocking welting machine and a toe-closing machine in operation. They have recently bought out a stocking-turner, which is a useful machine for the hosiery manufacturer. Other new machines shown in operation which attracted attention from necktie manufacturers were machines for finishing the ends of neckties and seaming neckties, making a neat, fine and straight seam. The Merrow Machine Co. has recently doubled its capacity and are now in a position to make prompt deliveries. E. H. Allen was in charge of the Exhibit, assisted by P. J. Smith. Mr. Merrow came on for several days to meet his friends and customers.

Walter R. Zeigler of Riverside, N. J., showed a fine connection of hosiery bands, labels, tickets, box tops, etc., and other printing specialties used by knit goods manufacturers.

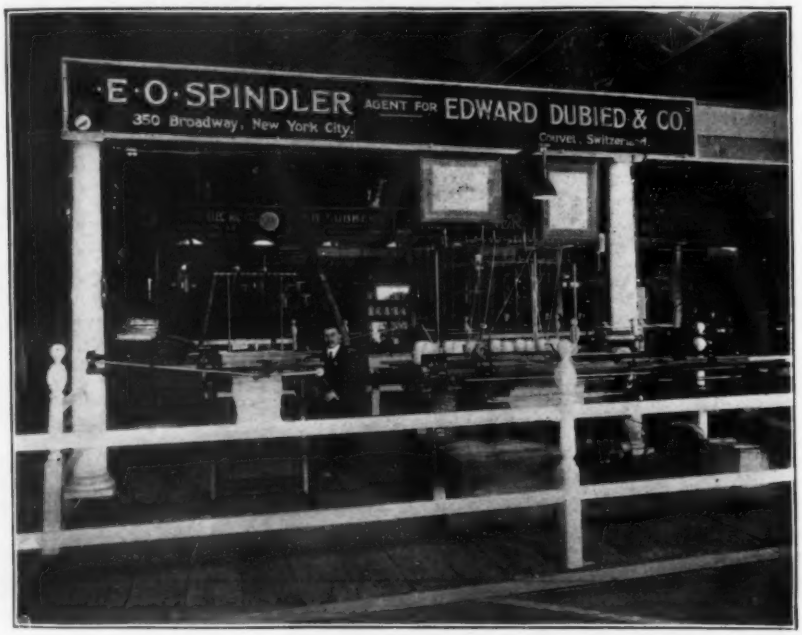
The Jenckes Knitting Machine Co. of Pawtucket, R. I., exhibited a full line of their latest model fine gauge Invincible machines, for knitting hosiery with a high spliced heel and double toe, reinforced heel and toe and also to change the yarn in heel and toe, garter top, etc. This company has specialized on fine gauge machines for a number of years, and their 234 needle 3 1/2 inch diameter machine is claimed to be the finest gauge machine of the circular latch needle type. This machine is equal in gauge to 250 needles in a 3 3/4 inch diameter. Owing to the fineness of the gauge the elasticity of the fabric produced is such that an exceedingly narrow and tight foot and ankle can be obtained with a top of sufficient width and elasticity.



THE JENCKES KNITTING MACHINE CO.

Scholler Bros. Co., 3301 Amber St., Philadelphia, exhibited their line of soaps, softeners and specialties for dyers, bleachers and finishers and also samples of fabrics treated with their products. F. C. and H. H. Scholler were in attendance.

E. O. Spindler, 350 Broadway, New York, had one of the large spaces fronting on three aisles. A machine that attracted particular attention was a new full automatic knitting machine for shaker sweaters, which was of special interest on account of its large production. Another machine shown was a shaker flat sleeve machine. Further on was a full automatic fashioning machine for ribbed sleeves and union suits. Several other types of fine gauge flat knitting machines were shown. This exhibit attracted attention on account of the new developments in the construction of flat knitting machinery.



E. O. SPINDLER.

The Berlin Aniline Works of New York, were well represented as usual, and had a fine display of hosiery dyed with their principal colors suitable for this purpose. It included cotton hosiery, both mercerized and plain, as well as silk hose for women and men. Their well-known Sulphur Blacks are widely used by the knitting trade, while for mercerized hose and silk hose their Zambesi Blacks, especially the V brand, have found great favor with the hosiery dyers.

The Hess-Bright Mfg. Co. had the same attractive exhibit of their friction reducing Ball Bearings that was shown at the Boston Textile Machinery Exhibition. It was a big undertaking to dismantle this extensive exhibit, pack it up and transfer it to Philadelphia and set up again in the short time available The exhibit is fully described and illustrated in the account of the Boston show The arrangement and illuminating features were even more attractive than in Boston and there were very few intervals of rest for Mr. Kunkle and his assistants.

William C. Robinson & Son Co., with works at Baltimore, exhibited under the charge of their Philadelphia branch their specialties in lubricating oils and greases. They are making a feature of stainless oil and non-fluid grease, especially adapted to underwear and hosiery mills. This concern operate their own refineries.

(Continued on page 350)

Correspondence and Notes

UPON TEXTILE TOPICS AT HOME AND ABROAD

THE MAINTENANCE OF SPUN-SILK QUALITIES

BY JAMES CHITTICK

All of the makers of spun silks, or schappe, either here or abroad, have established certain standard qualities of yarns which they try to maintain continuously. For instance, one of the great European schappe spinning concerns may have a series of perhaps a dozen grades, and in their various sizes of yarn, which will run by small gradations from the best to the poorest. Each of these grades will have a special suitability for some particular class of work. For some purposes, length of staple, strength, brilliancy, evenness, or whiteness of color may be essential, while for other uses yarns, inferior in one or other of these respects, and consequently cheaper, may answer.

One of the first questions that an experienced representative of a spun-silk mill will put to an enquirer for yarn will be as to the purpose for which it is needed. Some buyers resent this, deeming it unwarranted inquisitiveness, but in this they make a mistake, for if the salesman knows the purpose for which it is to be used he can advise his customer as to just how low he can go in quality and still get the results he is aiming at. Thus, if the material was to be used as filling in a foulard, which was to have a white ground with a few scattered figures printed on it, a quality of a long draft with very even spinning and a good white color might be essential. On the other hand, if the goods were to be printed in such patterns as Russian effects, a yarn very much inferior to the above could be used and still make the fabric as good in quality as was required, as the vivid coloring in the pattern would blind the eye to the character of the yarn used.

The spinner knows from his large experience with other users just what his various grades are best suited for, and for which they have probably been designed when first produced, and so can advise the manufacturer to his distinct advantage, as the latter seldom has the special and technical knowledge needed to enable him to decide aright for himself, without expensive experimenting in advance.

Many a manufacturer finds it necessary, as he generally does, to maintain the standard quality of a fabric, or when he brings forward again a quality of goods that he has made in the past, it is of the first importance to him to be able to get precisely the same grade of yarn—both as regards material and workmanship—as he has had formerly, and also to feel certain that he will get it. For this reason the market grades of the schappe, or spun-silk, makers are maintained at a constant standard year after year, and while occasionally a new grade may be added, or possibly an old one—in small request—may be discontinued, yet the principal numbers never change, and if you order 1/80 E. L. from this maker, or 1/100 D from that one, you will find the yarn to be practically identical with the same grades which you have bought before, whether one year or ten years previously.

Schappes or spun-silks are made of silk wastes of various sorts and from many countries, and the character and quantities of the wastes suitable may vary greatly from year to year. Approximately one-half the silk spun by the worm is unreliable and has to be worked up as waste silk. There are pierced cocoons; imperfect or damaged cocoons; unreliable silk from the exterior of the cocoons; the inner layers of the cocoon, too fine to reel off: waste made in cocoon reeling; throwster's wastes of various kinds, etc. These silks may be white, creamy, or yellow, and will be of many kinds and natures, Chinas, Cantons, Japans, Italian, Levantine, or what not.

In the degumming treatment, preparatory

to spinning, they may have been put through boiling-off processes, or may have been schapped, or possibly may have had the germs loosened by acid or alkaline treatments, as is sometimes done. These differing methods may give results ranging from the leaving in the yarn of as much as 15 1/2 per cent. of the natural gum, down to the entire discharging or boiling-off of it. The spinner is constantly faced with the problem of having to maintain standard grades, and at the same time being at the mercy of a fluctuating supply of raw material, both as regards quantity, quality and price.

It is apparent that if one grade was made exclusively of China punjums, or another of Canton filature waste, it would not be possible for the mill to make its normal quota of such grade, or perhaps any quantity worth talking about, if the supply of the waste on the market was extremely small, or if none of it, perhaps, were available. Particular wastes may also be cornered by speculators and the prices pushed up to points that spinners are unable to pay. In cases like the above, there would be no use in the spinner trying to substitute some other waste, as it simply would not make the same thing.

To meet conditions such as have been outlined, the practice has grown up among spinners of waste silk to make their yarns out of blends of various stocks, using the larger proportions of those sorts of which the usual supply is large, and the smaller proportions from those varieties that are relatively scarce. Thus, a particular yarn might be made up of proportions such as 30, 30, 20, 7, 5, 5, and 3 per cent. of different wastes, or another might be 40, 20, 20, 10, and 10 per cent. Now, if the waste of which 30 per cent. was used was in short supply, and only 10 per cent. could be obtained, the substituting of 20 per cent. of the nearest quality available would not damage the character of the yarn to an appreciable extent, or, if one of the mixes of which only 5 or 10 per cent. was used could not be had at all, its replacement entirely by another selection would similarly have little effect upon the finished product.

It is needless to say that long experience and a high degree of technical skill on the part of the spinners has been required to work out blendings which are not only proportionate to the ordinarily available waste supply, but which give to the manufacturers the qualities of spun silk most useful to them. These careful and intelligent efforts, looking to the standardizing of the yarns produced, are deserving of the highest commendation, as they tend directly to assist manufacturers in the construction of reliable merchandise.

From the foregoing explanations, it will also be seen that it would require unusual discrimination on the part of a manufacturer to properly appraise the merit of a spun silk yarn by observation of its fibers when untwisted and drawn apart.

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A HAND BOOK OF WEAVES

By G. H. OELSNER, Director of the Weaving School at Werdau.

Translated and Revised by Samuel S. Dale

This Series began in July, 1911

Figs. 602 to 623 show fancy twills formed by combinations of twill lines with various other weaves:

Fig. 602, 40 warp, 40 filling.
Fig. 603, 30 warp, 30 filling.
Fig. 604, 12 warp, 22 filling.
Fig. 605, 30 warp, 60 filling.
Fig. 606, 16 warp, 16 filling.
Fig. 607, 30 warp, 60 filling.
Fig. 608, 32 warp, 32 filling.
Fig. 609, 16 warp, 32 filling.
Fig. 610, 32 warp, 64 filling.
Fig. 611, 32 warp, 64 filling.
Fig. 612, 50 warp, 50 filling.
Fig. 613, 24 warp, 48 filling.
Fig. 614, 16 warp, 16 filling.
Fig. 615, 32 warp, 64 filling.
Fig. 616, 18 warp, 45 filling.
Fig. 617, 16 warp, 32 filling.
Fig. 618, 16 warp, 38 filling.
Fig. 619, 33 warp, 33 filling.
Fig. 620, 40 warp, 40 filling.
Fig. 621, 48 warp, 54 filling.
Fig. 622, 60 warp, 48 filling.
Fig. 623, 60 warp, 60 filling.

(Copyright, 1912, by Samuel S. Dale.)

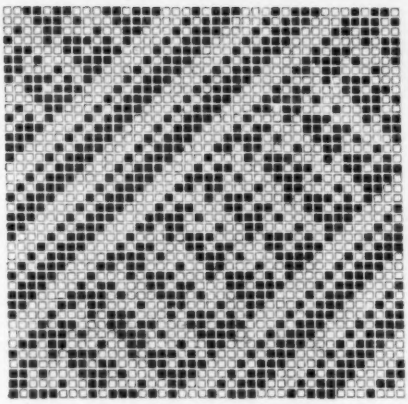


FIG. 602.

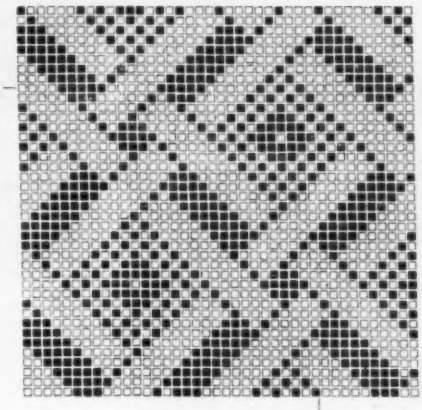


FIG. 603.

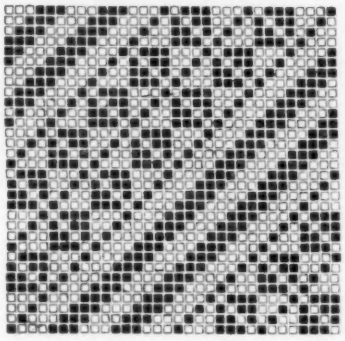


FIG. 608.

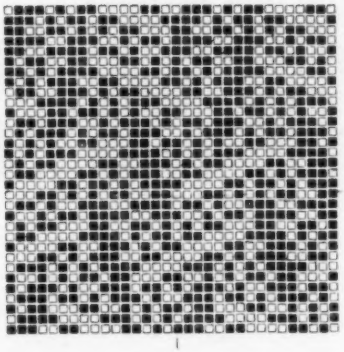


FIG. 609.

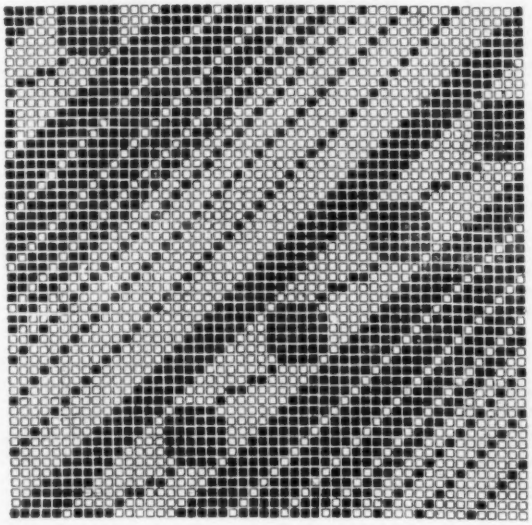


FIG. 612.

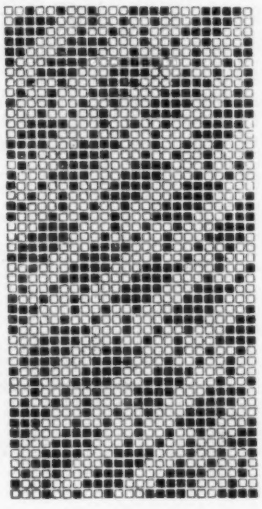


FIG. 613.

FIG. 604.

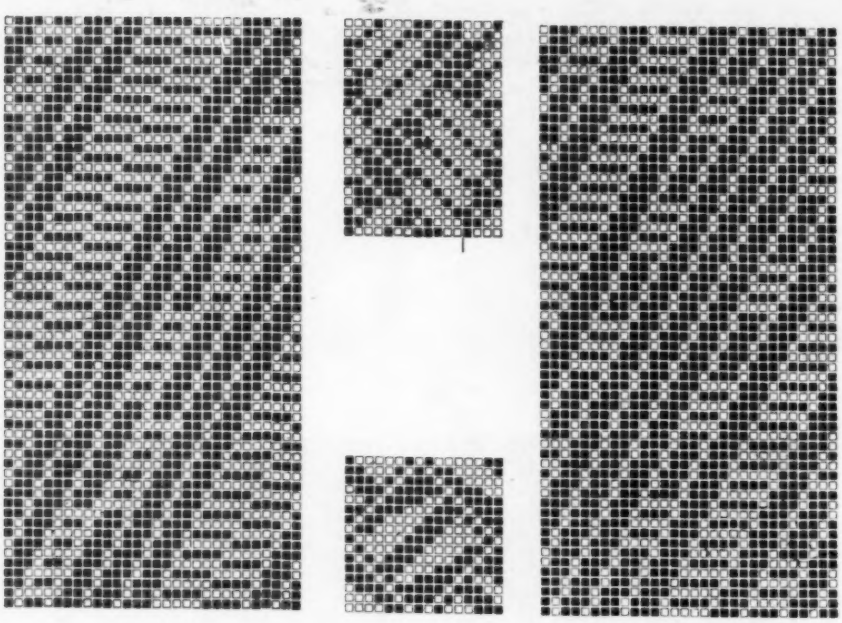


FIG. 605.

FIG. 606.

FIG. 607.

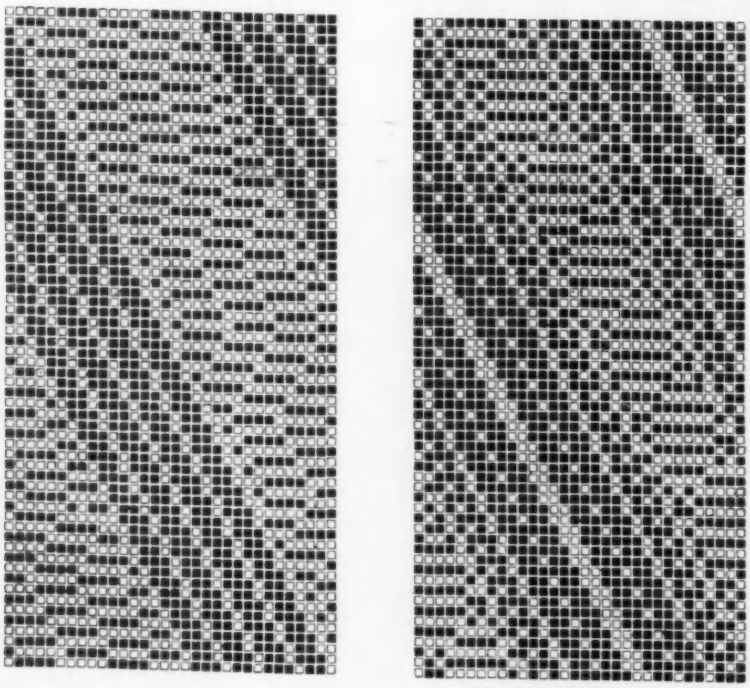


FIG. 610.

FIG. 611.

FIG. 614

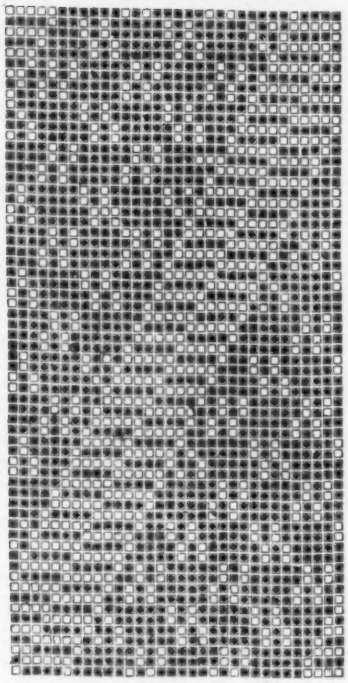


FIG. 615.

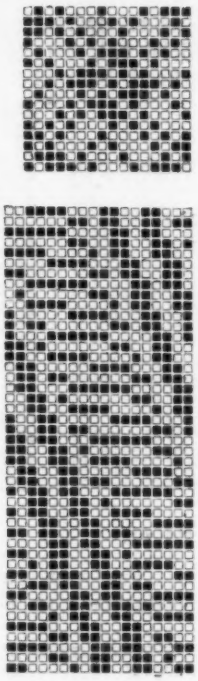


FIG. 616.

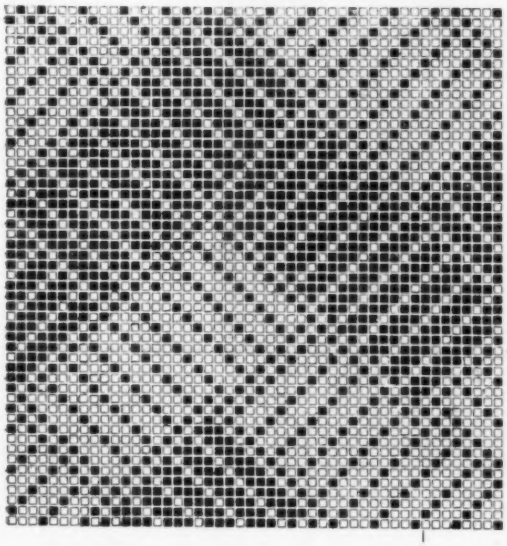


FIG. 620.

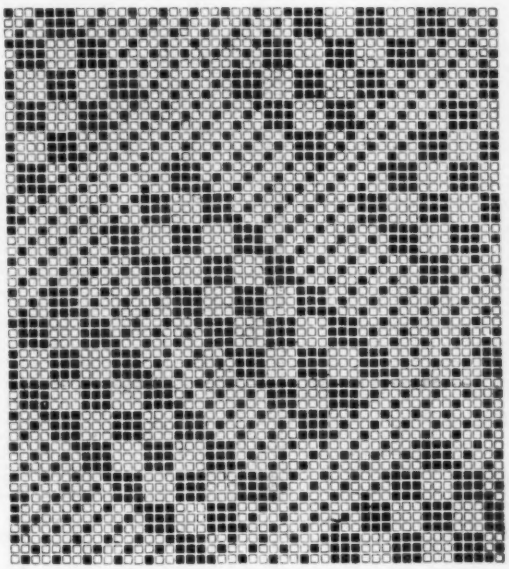


FIG. 621.

ARTIFICIAL SILK FROM JUTE

A process by which ordinary jute is converted into artificial silk has recently been patented by Richard Schreckenbach, Salzgitter, Germany. The raw jute fiber is treated in a fermenting bath to which glycerine is added. The material is then rinsed in water and dried. The fermenting bath differs from the ordinary bath in that it contains glycerine. The treatment in this bath removes the gummy substance from the jute and separates the fibers without destroying them. The result is a smooth, fine, lustrous fiber which can be spun to No. 300 and higher. After the rinsing, the fiber is treated in a 3 per cent. solution of peroxide of sodium. The material then resembles the best silk as far as luster, softness and pliability

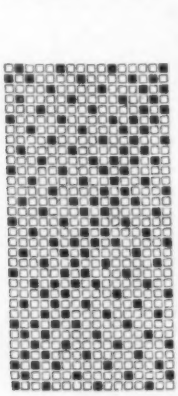


FIG. 617.

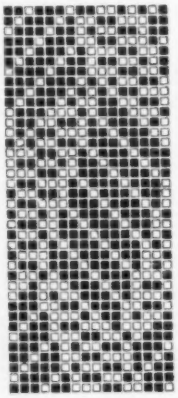


FIG. 618.

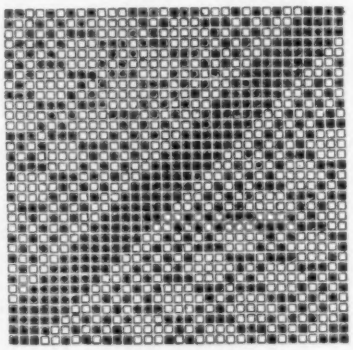


FIG. 619.

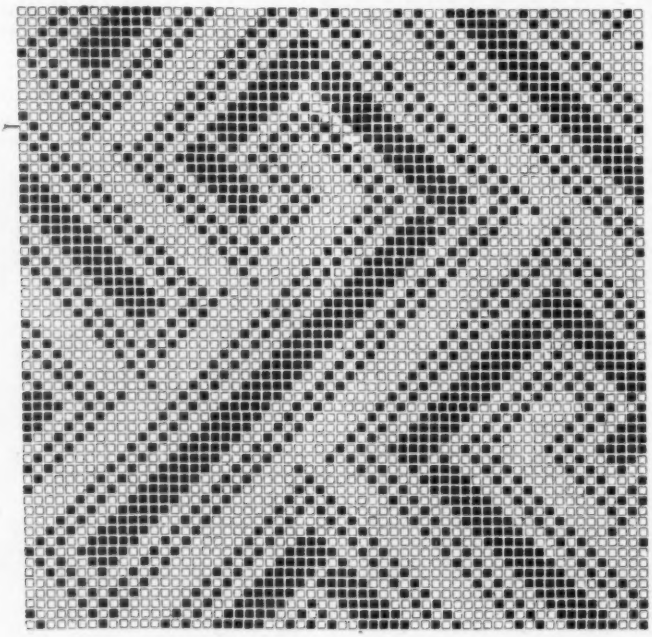


FIG. 622.

are concerned. The process has the advantage of a low cost of production.—Leipziger Monatschrift fuer Textil-Industrie.

MILL EXPERIENCES

Under this head we will publish from time to time stories from practical mill men, telling of vexatious and unusual difficulties which have occurred in different branches of mill work, and how they have overcome them. We invite mill men to send us an account of such experiences. We pay of course for all that we use. Facts told just as you would tell the story to a friend are what we want, not fancy writing.

THAT FIRST OVERSEER'S POSITION

BY COLFAX

(Continued from February.)

As the weeks and months rolled by and I met and overcame the hundreds of trying problems that are constantly presenting themselves to every overseer, I became more and more confident that I was capable of meeting successfully any problem in carding that was likely to present itself. In fact, I rather welcomed the appearance of some trouble out of the ordinary and found a whole lot of satisfaction in locating the cause of the trouble and applying a remedy. Although there were still many things that I wanted to do to build up the room to my idea of how things should be, still I had been pretty well through the machines and on the surface everything seemed to be running smoothly. The production and quality were entirely satisfactory and despite the fact that I had four new mules to supply work for, there was no great difficulty in my doing this. At the same time, by a little planning ahead, I could always arrange to take whatever time was necessary to stop a machine and try out some new idea or experiment. It was a part of my plans to arrange for a systematic method of doing things in the room, as for instance the establishing of a regular system of grinding, whereby all the cards were taken in rotation and put in thorough condition. In planning for this work I found that about once in six weeks was about right for the first and second breakers and the finishers would come in at longer intervals.

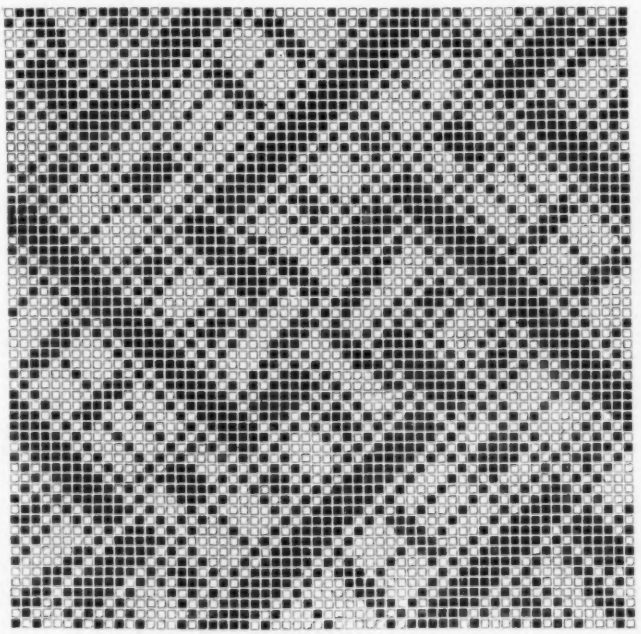


FIG. 623.

In going through the machines I had taken the Bramwell feeds practically apart, that is, I had taken off all the working parts, including both the spike and wipe aprons, cleaned up everything thoroughly, such as bearings, oil holes, repaired aprons when necessary, also the screens under the hoppers and after all were in order and carefully adjusted it certainly did make a considerable difference in the way those feeders worked, there was less rattle and noise, the stock was better prepared for the card clothing and consequently added to the quality of the work produced. During my later experience I had a good opportunity to note that the carelessness or ignorance of several carders as to the importance of the Bramwells had cost them dearly, and it is perhaps no exaggeration to say that when the important work of this machine is taken into consideration, there is no machine that is so neglected in the average mill as this is.

My rules for caring for the machinery called for a regular overhauling of all feed rolls from the first breakers to finishers every so often. This included cleaning out the wire thoroughly as well as seeing that all bearings were clear and well oiled and properly adjusted. The work of stripping the cards was laid out on time and whenever the cards were stripped, the tumblers were also to be cleaned. I figured that quite a lot of waste was to be saved by keeping all wire clean and sharp. In connection with my system of grinding I also included the grinding of all fancies whenever the cylinder was ground, it being my theory that the fancy, to do its best work, should be smooth and free from ridges that so often are seen and that will surely appear in any fancy that is not cared for. There are many carders I know that insist that the fancy does not need grinding and that it is bad practise to do so, but I found it gave me satisfactory results and I preferred to continue it.

The care of the belts on the machines was another item that I gave a good deal of attention to. Whenever the strippers were running out a card they used an old hand card to clean the fly from all the belts and on stopping the card their first work was to look over the sewings for weak spots. Repairing them then saved time and possible accidents by preventing the belt from breaking when the machine was running. It took me some time to get the rub rolls into the condition I wanted, as it was necessary for me to arrange to get out a lot of fillet leather which had to be cleaned up by pulling out the wire. Now in doing this work, I devised a little wire pulling machine that really did a tremendous lot of pulling and did it as well as any hand work could have done it and of course in one-tenth the time.

Having prepared a good supply of fillet I began to carry out my plan of taking one condensor at a time and cover every roll, including the wipe rolls. In doing this work I adopted the methods of one of the carders for whom I had worked as second hand and for whom I always had a great deal of respect both for his ability as a carder and for the executive ability he displayed in managing a pretty good sized room. This method involved a thorough cleaning of the rolls, a careful truing of the spindles at each end, by placing them in the machinist's lathe and peaning. When ready to put on the fillet the roll was first covered with a generous coating of prepared glue and the fillet then wound on good and tight, always using the clothing drum the same as if putting on a worker. The ends were nicely fitted and instead of using tacks I used wooden pegs. I would arrange things so that I could leave the covered rolls set over night or perhaps over Sunday. This gave the glue a good chance to set and the leather was sure to be firmly fastened. Then all rolls were ground as smooth and even as it was possible and the invariable result was a mighty nice set of rolls that were capable of doing good work and lots of it.

While the grinding was going on all the gears were soaked in a hot solution of sal soda and all bearings and every part of the condensor cleaned up thoroughly, so that when things were put together there was quite an improvement in the appearance of the condensors. With the rolls carefully set and the machine started a considerable increase in production was obtained, due, of

course, to the increase in the size of the rolls. I found also that the improved rubbing capacity of the new leather permitted me to decrease the vibration speed by either shortening the stroke or slowing up on the driving shaft. All these little things combined made for improvement in the way of more perfect work, permitting winding of more roping on each spool and allowed of operating with little or no noise.

It took about a month to complete the fixing up of the condensor and I was very well pleased with the results. I had now been entirely through the machines and all that was necessary for continued success was to see to it that things were kept in proper condition. I had sense enough to know that it would take but a little time to undo what I had done and I was extremely careful not to go backwards. During all this time I was a close reader of textile papers and very naturally noted changes of carders here and there, until finally the desire developed to secure a position with a larger mill and if possible locate in a district where there might be several mills. In short, I felt I would like to get into a good sized weaving mill where I could accomplish more than where I was.

My relations with my employers had been very pleasant, particularly so with the agent, but the superintendent, with whom I of course had to deal with most, had on several occasions been quite brusque in his orders, unnecessarily so it seemed to me, and so it happened after I had been with them a little over three years I had my first real argument with him and which was brought about in this way. On number one set was a black and white mix and on number two a very dark blue and white mix; each contained the same percentage of white. Now the stock from the cards after leaving the picker room was kept in the attic, two floors above the card room, with a chute arrangement from the attic to each card and enough stock could usually be put down each chute in the morning to last the cards a full day. It was the duty of one of the men from the pickers to attend to the filling of these chutes.

The black and white mix was running out, but the boy attending the feeds was not aware of this and along about 5 o'clock in the afternoon, after the lights were on, he found the chute empty. As was his usual custom in such cases he went to look for the man who took care of it and not being able to locate him immediately he went to the attic himself, opened up and put down a sheet of what he supposed was the same stock that was running out, but which in reality was a blue mix instead of the black. In the very dim light he did not notice it. No one discovered the mistake until the next morning at daylight and with perhaps an hour's run the night before and probably half an hour's run the next morning the blue mix had blended in pretty well with the black when we discovered it. We hurried to the spinning room to see if any of it had gone into yarn. We found a couple of spools in the mules that were quite streaky and it was evident that at least one set of bobbins had been taken off with at least a couple of sections of mixed yarns.

The boss spinner was a man twice my own age and while we worked together with very little friction I had the impression that if anything was wrong with the card room he took delight in magnifying the trouble to the limit. The trouble at hand on this occasion was the worst yet experienced by me, not because there was any mystery about the cause of it, for the whole story was as plain as could be. The boy promptly told of his putting down the sheet the night before and there was no trying to dodge the responsibility by anyone.

Of course we ran out the first breaker at once and stopped the second breaker and finisher and we were getting the first breaker ready to start a new lot when the superintendent arrived. He had been sent for by the boss spinner, as was of course proper, and after giving instructions to let things stand until he investigated he came to the card room. I had all the story of just how it happened from the boy, who, by the way, was a bright, clean, industrious youngster. As he told me just how he happened to try

to do somebody else's work in addition to his own, he cried bitterly as he no doubt felt that I would discharge him.

So when the superintendent arrived I told him just how the mistake was made. He talked and acted as though this was an occasion for him to spread himself in the way of a lecture. As the boss spinner had come up to see how things were looking and as my second hand and stripper were cleaning the first breaker, beside which we were standing while he was talking to me, all listening, I felt a good deal like the proverbial three cent piece with a hole in it. I was feeling pretty glum myself naturally as I appreciated that it was a very annoying experience for all and of course there was an uncertain monetary loss to be reckoned with.

It was not so much what he actually said that hurt me, but the "nawsty" way in which he said it, so that when he motioned for the boy to come over to where he was standing and curtly ordered him to go to the office and get his money, I objected, protesting that the boy was not to blame, that it really was my own carelessness in not watching the proceedings closer. He, however, appeared to have little patience with any excuses and as he again peremptorily motioned the boy to get out, I went up in the air as high as he was and told him flatly that if he insisted upon the boy getting out that he could count me out on the spot, and followed this by going at once to the desk, removing my overalls and preparing to pick up.

(To be continued.)

SPEED VARIATION IN MULE DRIVING

BY JAMES STRAND

Electrical engineers are the most prominent apostles of the advantages of steadiness in mill driving. They have studied carefully the question of what the variation in transmission speeds is in places where power is supplied otherwise than through electric motors. These researches promise in the long run to add materially to the common stock of precise knowledge. The instruments are at hand for taking exact observations and making careful comparisons. Only opportunity and perseverance are needed to disclose a great many facts which have not hitherto been publicly recorded. The electrical manufacturing engineers publish diagrams from time to time showing records of power consumed during the day. It is not less interesting to have charts showing the variation over shorter periods of time—as for instance of speeds during the time that a cotton mule is (a) drawing and spinning, (b) spinning, (c) using fallers and (d) winding.

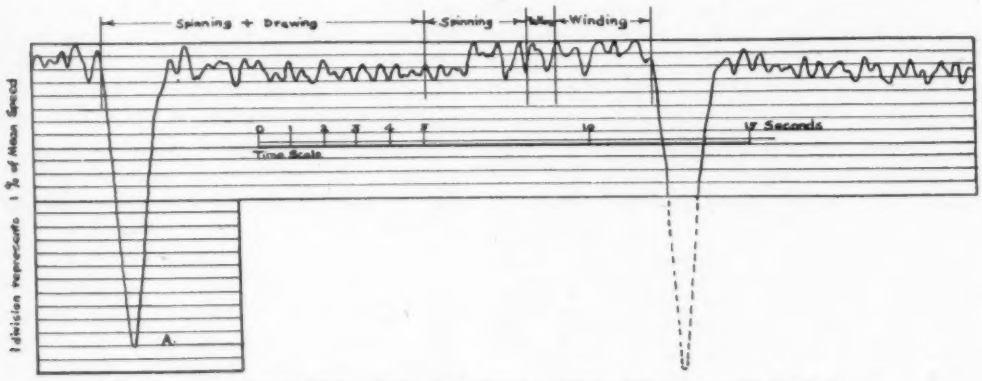


FIG. 1. ROPE DRIVEN MULE. TIME, 15 MINUTES; TOTAL VARIATION 29½ PER CENT.

Some records of these points have been taken by A. Kelly, consulting engineer, of 18 Exchange St., Manchester, Eng., and the curves are exhibited herewith. The results were obtained with a Horn's tachograph applied to the countershaft of three mule frames, each carrying about 1,100 spindles and all doing similar work. Fig. 1 relates to the eighteenth mule in a set of twenty driven by rope from a main line shaft running 290 r. p. m. with a countershaft making 497 rev-

olutions. The fluctuations in the line shaft ranged from 2.3 per cent. at the driving point to 4.4 per cent. at the further end.

A very steep drop in speed at the beginning of the spinning period, followed by a quick and smooth acceleration is the salient feature of this experiment. The initial drop is about 23 per cent. and in four mules in the same mill the loss of speed at the same point was respectively 17 1/4, 23 1/4, 29 1/2 and 33 1/2 per cent. In the last named case the maximum was not regained until the end of the draw. In the record, Fig. 1, it is seen that the draw occupied ten seconds and that the speed was recovered in a little more than two seconds. Fig. 2 is a record in which the initial fall was slight, and the recovery was severely jerky, probably because of defects in the belts. The points marked "B" on this record are those where a neighboring mule was commencing its draw and so putting the utmost demands on the source of power. The mule was the sixth from the driving point in a room of ten and the countershaft ran at 450 r. p. m.

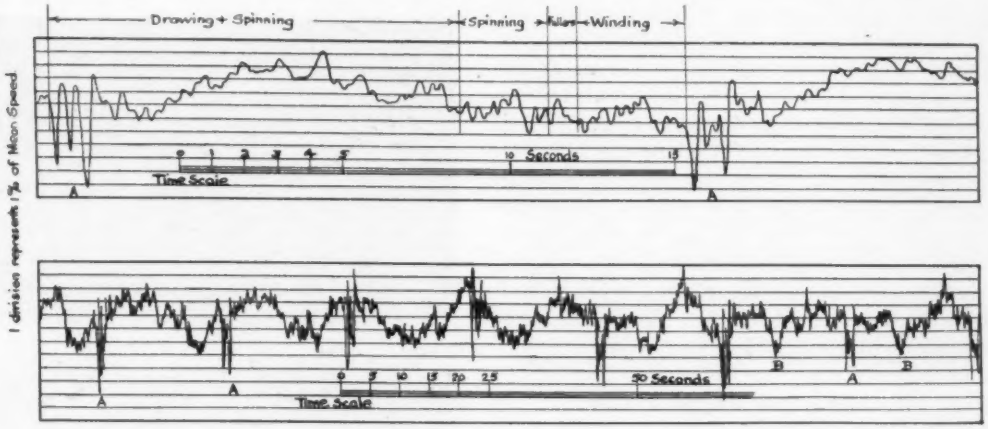


FIG. 2. ROPE DRIVEN MULE. TIME, 15 MINUTES; TOTAL VARIATION, 12 PER CENT.

The record shown at Fig. 3 refers to the tenth mule in the same room, driven by a 20 h. p. enclosed three-phase hanging motor, and running at 980 r. p. m. The motor had a 25 1/2 inch flywheel with a 4 by 4 in. rim.

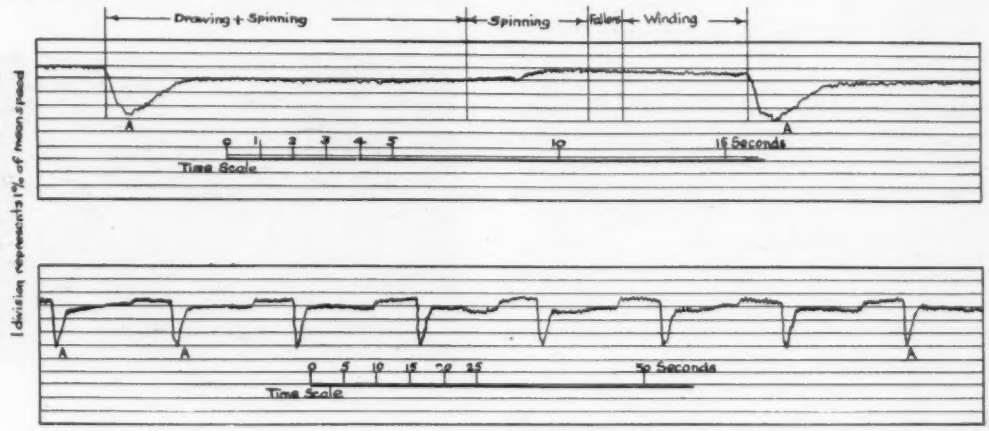


FIG. 3. MOTOR DRIVEN MULE. TIME, 15 MINUTES; TOTAL VARIATION, 4½ PER CENT.

It was driven by belt from a double-width pulley, fast and loose pulleys being on the headstock of the mule. The reading was taken from the motor shaft, as being the position corresponding to the countershaft in the mules mechanically driven. There is in the diagram an immediate fall of about 3 1/2 per cent., followed by a smooth recovery and a practically constant speed throughout the rest of the operation. The motor-driven mule was of course isolated from any neighboring machines. It had the advantage of a fly-wheel and a high speed prime mover, whereas the others had to start from an engine making 75 to 100 r. p. m., with a speed of 4,000 to 5,000 feet per minute.

DESIGNS FOR DRESS GOODS

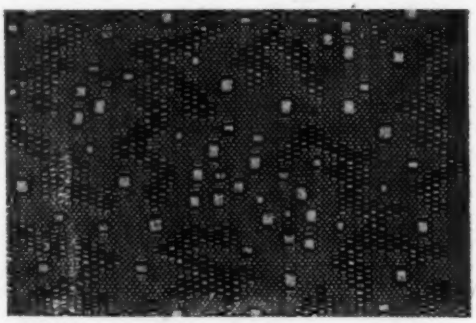
BY J. W.

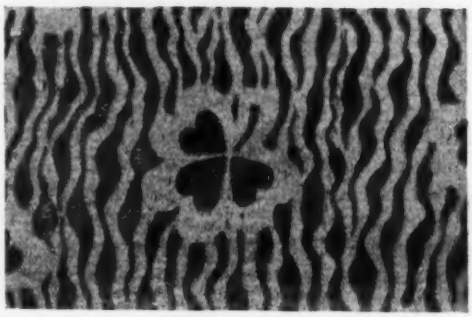
Fig. 1 is a silk and woolen mixture, made: 2/60s spun silk for the warp and 30s worsted for the filling. This peculiar design is known as "Entaglis." Various weights of cloth are coming to the front. This cloth is fashionable in all colorings and in white. Some beautiful effects may be produced by having a cream colored warp, and using delicate shades of blue, pink, lavender or lilac, green, or cream fillings. In this class of goods the main feature is the equal distribution of the figuring in the cloth. A jacquard loom will be required to produce this cloth.

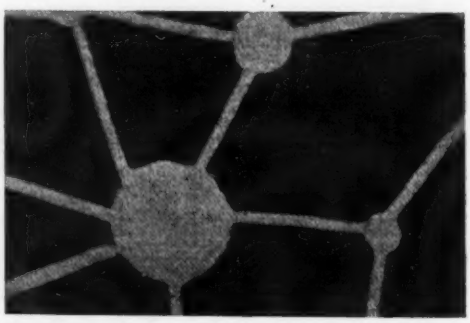
Fig. 2 is a printed silk satin cloth suitable for blouse cloths. The "Shamrock" spotting is in the order of a 5 leaf sateen and is very effective upon the wave ground. This pattern is made in all colorings. Some good imitations are on the market at present in mercerized cloths produced from a fine two-fold warp and fine Egyptian filling.

Fig. 3 is a printed silk satin cloth of a good quality. These web designs are of various sizes, chiefly white web figuring upon dark grounds, such as black, navy, dark green, rose pink and ruby red. Fig. 3 is large design of this class. The patterns selling best are those which cover about one inch. The weaves vary from a 5 to 11 leaf satins.

Fig. 4 is a design for a "Crimp" cloth. Dark grounds are desirable with printed yarns for stripes, or with coarse threads for cords. The "crimp" effect may be produced



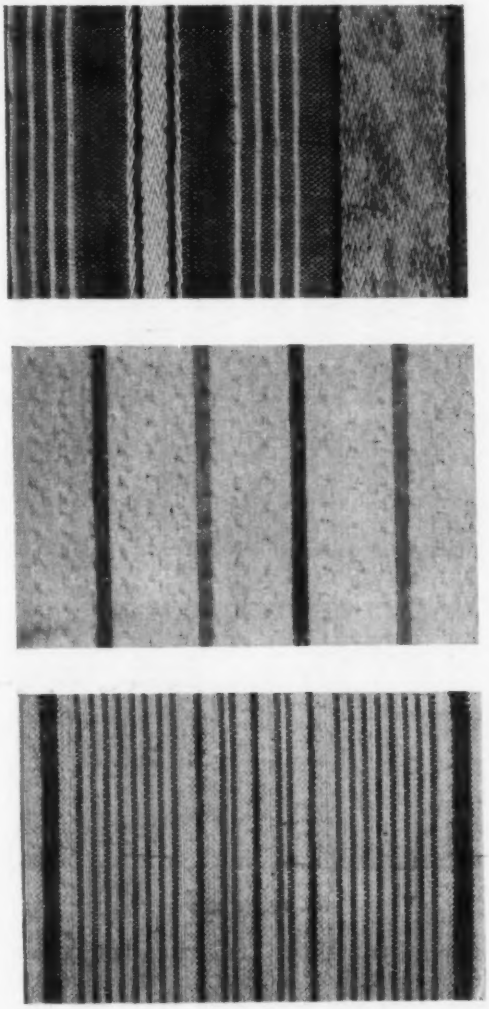




FIGS. 1, 2 AND 3.

by having a hard twisted yarn on a small beam which must let the yarn off slacker than the other portion. Chintz prints are most effective. The ground and crimp may be a plain weave and the large stripes a 5 leaf satin. The usual makes of Zephyr cloth may be used.

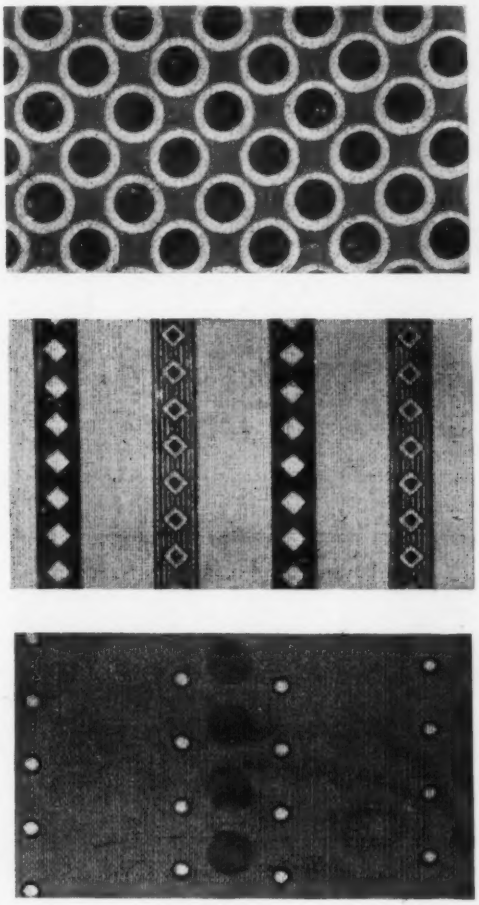
Fig. 5 is a Crimp cloth produced in the same manner as Fig. 4. The ground and crimp weave is white and the stripes are black and slate alternately. The colors chiefly used are: dark green and light green, dark brown and fawn, dark blue and light blue, two shades of the same color.



FIGS. 4, 5 AND 6.

Fig. 6 is another design for the same cloth as Fig. 5.

Fig. 7 is a printed design for a wool delaine. These fabrics are very fashionable at present in a good many makes. The ground in Fig. 7 is heliotrope, upon which a heavy round spot in a darker shade is used between white spots edged with black. There is a demand for this style in two shades of ground and large spot with the other spots, as given, included. A usual make for this class is: 32 dents per inch in



FIGS. 7, 8 AND 9.

the reed, 30s worsted warp, 64 picks per inch, 30s worsted filling, cloth 28 1/2 to 30 inches wide.

Fig. 8 is a wool delaine like Fig. 7. The fancy stripes are desired in all colors. The grounds are chiefly white, cream, light pink, light blue, etc., with heavy colors for the

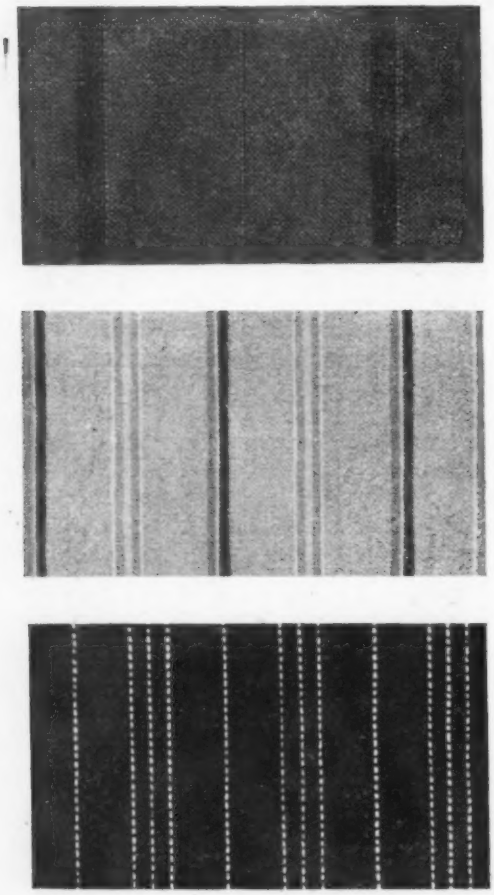
stripe. For darker designs the ground is black, the opposite to the particulars given above.

Fig. 9 is a geometrical design for a wool delaine, the particulars being as for Fig. 7. Two shades of the same color must be used in this class. Fig. 9 makes up very effectively for blouse cloths.

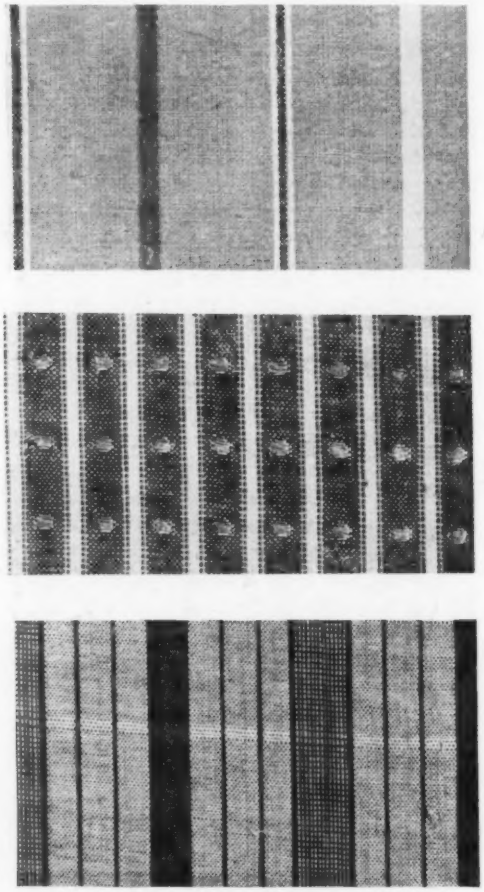
Fig. 10 is a wool, silk stripe and cord dress cloth used at present for costume cloths. This pattern is made in all shades of color. The weave for the silk stripe is an 8 leaf satin, ground and cord weave plain. The cord is produced by having a coarse thread in one dent of the reed.

Fig. 11 is a wool fancy suitable for costumes, blouses, shirtings, etc. The stripes are black and light slate. The ground weave is plain, upon which cords are produced by coarse threads in the reed. This class are doing best in white or cream grounds and colored stripes as: red and light green, brown and light heliotrope, sky blue and fawn, blue and pink, dark green and light blue.

Fig. 12 is a cheap cotton cloth which is doing very well at present in all colors. The white stripes are 2/40s, drawn two threads together and woven 3 picks up and 1 down. The usual zephyr makes of cloth are suit-



FIGS. 10, 11 AND 12.



FIGS. 13, 14 AND 15.

able. Small, neat patterns sell best. The grounds are in black, navy, dark green, brown, red, blue, rose pink and dark heliotrope. The weave for the ground is plain.

Fig. 13 is a "zephyr" design for blouse and dress cloths. Large patterns are mostly wanted. Light heliotrope ground, white and dark heliotrope, white and black stripes are very effective, all used in the same design. The weave for the stripes may be a 5 leaf satin or a matt weave. All colors of ground with varied stripes may be produced.

Fig. 14 is a spot and stripe zephyr cloth. Silk filling is thrown over the spotting only. Otherwise the usual make is a light cloth from 30 to 36 dents per inch in the reed, 26s to 48s warp, 60 to 90 picks per inch, 32s to 60s filling. The spotting is very effective alternately instead of in a row. The silk filling may also be thrown on the face of the cloth for check patterns. The weave in that case must be a 6 leaf filling twill.

Fig. 15 is a design for a cotton cloth which is being used in all colors for blouse and dress goods. The weave is plain. The particulars for manufacture are: 36 dents per inch, 2 threads in a dent, 26s cotton warp, 64 to 80 picks of 40s filling per inch. The colorings are 1 thread color 1 thread white, 2 threads color 2 threads white, upon which heavy stripes are made, and colored filling used.

"PER THOUSAND PICKS"

A movement begun in Huddersfield has for its object the formulation of a standard weaving price-list, based not on the quarter-inch pick or the ten-foot "string," but upon the thousand picks. The idea is to draw up a scale for weaving done by women upon 80-pick looms, taking one cut, one beam, and one shuttle as the starting point, and stating the additions to be made when the weaving is done by men and when more beams or shuttles than one are necessary. It may be possible in this manner to construct a scale that shall facilitate comparison with the rates paid in other countries and readily show what is due to the weaver. As manufacturers would still have to reckon in terms of picks per inch the list might be of less direct use to them than to other parties. As in the case of most new things, some time may be expected to elapse before the adoption of the proposed system becomes general, even should it survive the ordeal of the negotiations between the trade union and the associated employers.

The system of paying for woolen and worsted weaving at so much "per thousand picks" is general in Germany, although in Gera, Greiz, Glauchau, Meerane, and some other places the payment is reckoned "per 100,000 meters" of weft thread woven. In Austria payment per thousand picks is usual, but the rule is varied by time-wages in some districts. The thousand picks (with extras) is the universal basis in Belgium, and is adopted in Sweden. , In France the system is extending in popularity, but weavers' wages in Roubaix are based on the picks per centimeter, to which are added in certain events extras, based on picks per "rang" (of 104 1/4 inches). In the United States a fixed price per yard is the common unit, varied with systems of paying so many one-thousandths of a dollar per pick per inch per yard.

It appears that payment "per thousand picks" has a considerable body of adherents, and as the number of picks woven is commonly shown by a mechanical counting device or taximeter "clock," operated by the picking motion, the sum due for wages is easily ascertained. Presumably the trade unionists who are pressing for the adoption of this method in Yorkshire are not anxious to see adopted at the same time other customs in vogue in some of the countries in which this is used. They might not like their employers, for example, to pay them a stated wage per working week and defer until the end of the year the payment of the balance shown by the dial! That practice is not entirely unknown in Continental countries.—Textile Mercury.

The total increase in value of Japan's imports of wool, woolen yarn, cloths and serges for 1910 amounted to about $5,000,000, the increase in wool and woolen yarns being approximately 4,000,000 pounds.

Questions and Answers

Under this head we undertake to answer, free of charge, to the best of our ability, questions pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

If the question is not of general interest to textile readers and involves expensive investigation, a charge covering the cost may be made, of which the inquirer will be advised before any expense is incurred.

BLEACHING KNIT GOODS

Editor Textile World Record:

We enclose two samples of bleached cloth, which was made from 30s combed peeler yarn. There is a noticeable difference in the shade of the two pieces which were cut from the same roll and passed almost simultaneously through the same process, i. e., chlorine. Can you state the reason for this difference? Bleacher (1996).

Many bleachers have experienced this same difficulty, which is as mysterious as it is vexing. Goods will go through the same process, have the same baths and yet when cut up show a marked variation in shade. It seems a difficult problem to solve, but it will occur every time the goods are a little short of bleach. This is especially true when the goods are bleached in the roll. In the first place, the goods are a little underbleached. The rolls being wound too tight, uneven packing in the kier, an under boiling, or taking them off the chlorine too quickly will very often cause this trouble. Every bleacher knows what it means when the goods are made up to have the body white and one sleeve brown, an increase of seconds, and decreased production on account of the time taken in sorting and shading. If they are passed and sent out with the firsts it means a big kick from the customer.

Now that the cause is located, the next thing is to remove the evil and lessen the effect on the goods in process. The bulk of the trouble is caused by having the rolls wound too tight. This trouble may be caused by a belt on the rolling machine being too tight.

If "Bleacher" will watch the rolls he may find that some of them are too tight at the center. When the rolls get larger the outer laps are slack, and the result is that when the goods are being boiled, the liquor will penetrate the outside lap easier than the center of the roll. In the baths it is the same, the outside cloth being a pure white, while the center of the roll will be darker. If "Bleacher" will watch the rolls and see that the goods are packed evenly in the kier, giving them a little longer time in the boil, and watch the chlorine bath, the unevenness in shade will disappear. Dulcimer.

FRICTION ON A SHUTTLE

Editor Textile World Record:

I would like to have some information in regard to the draft on looms. The warp is 32s and the filling 40s, weaving 27 inch goods on a 44 inch loom. Please advise me how the draft could be made and the manner in which it is inserted in the eye of the shuttle, also what kind of stock to use. I also have some difficulty in filling from 1 inch to 4 or 5 inches on a 2 by 1 and 4 by 1 loom.

Sanford (2020).

There are several ways of putting friction on yarn in a shuttle to get the best results. I would suggest that "Sanford" bore a 3/16 inch hole in the bottom of the shuttle at the entrance of the eye on the shuttle where the yarn enters the eye of the shuttle, and then draw a bunch of warp yarn that will fit the hole tightly. Cut it off at about the top of the eye. If the yarn is soft twisted, have the hole about an inch straight from the eye to the spindle on the shuttle and have the yarn as it comes from the bobbin pass through the yarn that is used for a friction so that it will hold it tight enough and prevent the drawing-in on the side. Be sure that there is not too much power on the loom, as that makes the shuttle rebound in the boxes. This will cause the filling to draw in on the side.

Some loom fixers use a flat wire, 1/4 of an inch wide. A groove is cut in the shuttle about half an inch below the eye and the wire comes flush with the eye of the shuttle.

The yarn will come in contact with the wire and thus cause a friction as it draws through the eye of the shuttle. I have always had good success in the first mentioned way, as the wire in the shuttle is liable to become loose if not properly fastened and break out the ends of the warp. Greenwich.

UNEVEN YARN

Editor Textile World Record:

Enclosed you will find sample of 2/12s that we are making which is very unsatisfactory. It is very irregular. We use low middlings about 1 inch staple, four laps on spreader, making 15 oz. lap for cards, and 4 in first drawing and 4 in second, making 50/100 hank roving for slubber. Two of these are drawn 1.50 hank speeder roving and there is a draft of 8.60 in the spinning.

The condition of the machinery is good as we have only been running about five years.

Austin (2021).

It is hard to tell, at this distance, the exact cause of the uneven yarn, as there are so many things that would cause the difficulty. I would advise the drawing rolls of the fly frames and spinning frame be examined, as these are often in condition to make just such yarn as the sample. It is a good plan to see that the drawing sliver is even, for often our irregular yarn can be traced back to this point. "Austin" should be able to find this out for himself and if the drawing sliver is even and satisfactory, then look for the trouble on the fly frames. Bad leather rolls, rolls not running smoothly, not enough weight on rolls, or too much tension on the roving, will cause the roving to be uneven, making uneven yarn. One of the most prolific causes of uneven roving is steel rolls that are worn at the bearings and bent or sprung, causing a wobbling motion while running. This draws the roving unevenly, causing thick and thin places to be made which will give corresponding thick and thin places in the yarn. The same conditions in regard to the rolls on the spinning frames would give the same results. One or more of these causes may be found in "Austin's mill." The drafts are about right and should give no trouble. There is a possibility of the rolls being set too far apart on fly frames or spinning. For one inch staple the front and middle rolls should be set 1 1/8 inches from center to center, middle and back rolls 1 3/8 inches. If the settings are all right, then the trouble must restrict itself to defects in the steel or leather drawing rolls.

Steuben.

SPOTS ON YARN

Editor Textile World Record:

Can you tell me the cause of the black spots in the enclosed piece of knitted cloth, whether it is in the yarn before knitting, or is it oil from the knitting frame? Pekin (2001).

In my opinion the oil stains were on the yarn before knitting. By raveling the sample it will be found that the stain is confined to one thread and covers about 1/4 of an inch. There is a very slight stain on the preceding thread. If the sample has been washed after knitting that would account for the stain on the other two ravelings, as the water would cause it to spread somewhat. If it has not been so treated it shows that the oil spots were on the yarn and that they have spread to the other loops. I have never known a knitting machine to cause oil spots of this description. Laguna.

Upon examination of the piece of knit fabric I find that the spots are caused by oil on one bobbin out of the set. The spots occur at regular intervals in the fabric, and this would seem to point to one spot of oil having dropped on the bobbin, either from the knitting machine or while in process of winding. Cumberland.

VARIATION IN YARN

Editor Textile World Record:

What would you consider a fair variation in numbers in yarn made from a mixture of

50% cone waste,
25% strips,
25% American cotton, 1 inch, in numbers from 10 to 14.

I find that the numbers do not vary so much on the 10s as it does on the 12s and 14s. These numbers are spun from a 2.40 hank roving double.

Maxwell (2003).

A half a count would be a fair average for variation in counts of 10s to 14s. In special cases yarn has been made with less variation on low counts. Generally as the counts run finer the variation is greater. A 2.40 hank double roving making 10s yarn will give a draught of 8.33 1/3 inches, 12s yarn will give 10 inches, and 14s, 11.66 2/3 inches. The

difference in draught of 10s and 14s is 3.33 1/3 inches. If the hank roving was such that the draught would remain the same, the variation would be less, that is, a finer hank roving for finer numbers. Low grade batches and soft stock will not stand the draughting as well as longer stock, either on spinning or fly frames. Winton.

A SLANTING WALE IN SWEATER GOODS

Editor Textile World Record:

We are sending a sample of sweater goods. You will notice that the wale slants instead of running straight. What is the cause of this?

Quebec (2019).

There are several reasons for the slant in the wale of the sample of knit goods submitted, but there are only two reasons for this defect if the cloth is knit on a shaker machine. After raveling the sample and examining it carefully I would suggest that if the twist is changed in the yarn it will overcome the defect. The spinner can give a right or left twist as ordered. If "Quebec" is having the same trouble with other yarns on the same machines, there may be that the stitch cams are not forming the stitch right, that is, drawing down one needle so that it gets its full length of stitch before the next needle begins to draw the yarn for the following stitch. If this is not done the drawing needle will pull the stitch from the drawn needle while forming the new stitch. This is sometimes called "robbing" the stitch and will give the results "Quebec" is getting. When working tender yarns it is well to have the stitch cams ground so that as soon as one stitch is formed the needles will be released. If they are held down it will cause holes. In knitting cotton yarn I have the cams ground to hold down 1 1/2 or 2 needles according to the machine being used. This gives smoother work and will hold the stitch so that it will not twist. On circular knitting machines this trouble often occurs and very often the stitch cams cause it, but on these machines the yarn take-up will also cause it. If these machines are not kept working free and the rolls set tight enough together to keep the cloth from slipping while the machine is knitting, this difficulty will arise. Denbigh.

COMBER WASTE

Editor Textile World Record:

We would like some information in regard to comber noil waste from Sea Island and Egyptian cotton. First, we would like to know how this waste is used by purchasers? Second, if it is spun, and if so what class of goods it is put into?

Vincent (2022).

Sea Island and Egyptian cotton comber noil waste is used in a large variety of goods, usually being mixed with Uplands in different proportions to make yarns suitable for coarse work. Some mills rework their own comber waste, of course, putting it in a lower grade of goods. So far as I know it is never used without mixing with other cotton. I know of mills making both combed and carded hosiery yarns that use their comber noils in making their carded yarns. A small proportion of noils and general mill waste are mixed with good cotton before being picked.

Sometimes in making cotton blankets, the filling for which is composed of the dirtier and lower grades of mill waste and also linters, a certain percentage of comber noils is put into the mix to give a soft, fluffy feel to the blanket. It is also used in mixing with cotton to be spun into coarse wearing yarns.

B. M. P.

PERCENTAGE OF COTTON IN WOOL GOODS

Editor Textile World Record:

Please explain the method of testing cloth made of wool and cotton to determine the quantity of each material. Faxon (2007).

The percentage of cotton in cloth made of wool and cotton is determined in the following manner: Weigh a fair sized sample of the cloth, then sew it up in a small cheesecloth bag and boil the sample for 15 minutes in a 10 per cent. solution of caustic potash (10 per cent. caustic, 90 per cent. water). Rinse the sample well, then squeeze out the surplus water by wringing in a cloth. What is left of the sample after this treatment is cotton, which should be exposed to the open air until dry and then weighed. A comparison of the weight before the treatment with the weight afterwards will indicate the percentage of cotton in the yarn. As the cotton shrinks slightly during this process 2 per cent. should be added to the weight of

the residue to allow for such loss. Ex. A sample of cloth made of wool and cotton weighs 20 grains before boiling out, and 6.9 grains afterwards, find the percentage of cotton.

6.9 + .14 (2 per cent.) = 7.04 grains.

7.04 (grains) ÷ 20 (grains) = 35 per cent. of cotton.

100 per cent. — 35 per cent. = 65 per cent. of wool.

ARTIFICIAL SILK

Editor Textile World Record:

We would like to know what the enclosed fiber is. We want to use this in place of silk, but we find it has not the same nature. Where does this fiber originate? Claxon (2015).

The sample of fiber sent is artificial silk, the original process for the manufacture of which was invented by Count M. de Chardonnet, and first exhibited by him at the Paris Exposition of 1889. There are now several processes for the manufacture of this textile substance, and I am informed that a score or more of manufacturers in the United States are using it more or less in their product. Of course it is not silk at all (i. e., animal fiber), but is produced from vegetable cellulose, such as pure cotton fiber. It is claimed to be as elastic as natural silk, but its real elasticity is only about 4 or 5 per cent. As to strength, a square meter of artificial silk will stand a breaking strain of 25 to 35 killograms. Raw silk will break at 30 to 45 killograms. Naturally, not being as strong as real silk, and less elastic, it has not the wearing qualities of the animal fiber. In density, artificial silk rates at about 1.49, coming between that of natural raw silk at 1.66, and natural boiled silk at 1.43. In luster and brilliancy it is claimed to be the equal of the natural product. Mr. Leyster H. Dewey states that it may serve an excellent purpose in the manufacture of stockings for incandescent gas mantles—as well as for purchases where the material is not subjected to severe conditions of wear, and not likely to come in contact with moisture; for some forms are said to melt under certain conditions of moisture very much like a thread of candy. In its early manufacture, under the Chardonnet process, starting with paper pulp—or pure cellulose—the chemical treatment transformed it into pyroxyline, or gun cotton—and made it inflammable to a high degree. A process of denitriycation became necessary to prevent the manufactured fabric from going up in smoke.

From time to time there have been rumors of the establishment of artificial silk mills in this country, but it is doubtful if there are any in actual operation.

Chas. Richards Dodge.

TESTING GREASE WOOL

Editor Textile World Record:

Please give me information regarding the method of testing grease wool to determine its shrinkage as practiced in French conditioning houses. Sanborn (2018).

This inquiry was referred to our French correspondent who replies as follows:

Grease wool is rarely conditioned. A sample of about 2 pounds is drawn from the lot. This is obtained by drawing small portions from a number of bales. These samples are taken from the fleeces on the outside of some of the bales and on the inside of others. Naturally it is necessary to draw the sample from different parts of the fleece. In testing large lots it is necessary to take the average of two or even three samples. The test sample thus obtained is weighed in grains. It is then scoured by the following process:

1. Washing in a solution of Marseilles soap at 120° F.

2. Rinsing in water at 80° F. The wool should be a clear white after this rinsing. The duration of the operations varies greatly, depending upon the condition of the wool.

3. Washing in a 1 to 2 per cent. solution of hydrochloric acid at a temperature of 120° F.

4. Rinsing in a 5 to 6 per cent. solution of carbonate of lime at a temperature of 120° F.

5. Rinsing in a solution of acetic acid at 80° F. After squeezing the water out by hand the sample is placed in an ordinary Persoz conditioning oven. The temperature

is raised to 212° to 240° F. At the end of three-quarters of an hour the weight of the sample is found to be constant, which indicates that all of the moisture has been driven off by the heat. The weight of the sample in this condition is then increased by the conventional allowance for moisture, which in the case of wool is 19 per cent. The director of the public conditioning house at Amiens is not able to state the exact time required for conditioning raw wool, as the time varies with the condition of the wool.

Gaul.

LONDON SHRUNK PROCESS

Editor Textile World Record:

Can you give me the best way of shrinking worsted goods in the piece? Please state whether the London or steam shrinking process can be done in a quick way. Sponger (2009).

The process is of English origin as its name indicates. It produces a shrink that is permanent and a positive advantage to the fabric. As carried out by best English concerns, it is a slow and tedious operation, two men being able to handle only from 12 to 18 pieces of English uniform cloth per week. Practically all the operations are performed by hand. The wetting out, rolling, unrolling and pressing being free from power attachments. As practiced in different establishments the process is modified to suit the requirements of the fabric and perhaps the hereditary training of the firm.

The fabric is dampened, a wrapper cloth of cotton slightly wider than the fabric is thoroughly wet out, and the two are rolled together smoothly and evenly, yet quite loosely. The moisture from the wrapper is absorbed by the fabric. After a suitable time the two are unrolled and the fabric hung or festooned and allowed to remain without artificial drying until almost dry. It is then taken down carefully and plaited with press papers, ready to go into the press, usually of the screw or knuckle joint pattern. After receiving its pressing which usually takes from eight to twelve hours, it is unpapered and again repapered, care being taken the second time to move the fold mark along so it comes in the center of the paper, this second pressing taking nearly as long as the first. The goods are then carefully unpapered and rolled or packed for the market. The use of the hollow plate press, the saturation of the fabric, and the allowing of the wet fabric to dry out on the roll are modifications that may be noticed.

In this country similar methods are employed but we have substituted mechanical devices to aid in the handling. The goods may be dampened by a spray or dewing machine and rolled loosely. The wrapper is run through a tank, squeezed out and then the fabric and wrapper rolled together by a machine designed for the purpose; or the fabric is submerged or saturated and then squeezed out, being rolled up loosely before going to the hanging racks. The hanging racks are moved by mechanical means. No artificial heat is used and nature is allowed to do its work. The fabric is handled carefully so as to avoid any liability to stretch, either from selvage to selvage or along the warp. The pressing is done very carefully and is sometimes only a slightly warm ironing process with very little pressure. The use of steam in many cases has a tendency to shrivel rather than shrink the fabric, and while of use in warming the fabric before moisture is applied, is not considered as good practice as the water method. As previously stated the American manufacturer has adapted the older London shrinking methods to our modern system by introducing mechanical means to supplant the slower, yet more perfect hand processes. The words more perfect must, however, be understood to apply only when the hand processes are performed by people who have had the necessary training in this art. They would hardly apply to the mill help that we find in our finishing and sponging departments.

The two facts that are seemingly most important to the manufacturer are that the fabric during the wetting out and rolling must be carefully kept clear of wrinkles, strain, or distortion; and secondly, that wetting out is only a means to an end, the shrinking comes with the drying. Any forcing of this process or any roughness in handling the fabric during the process is detrimental to the best results. E. H. M.

Knitting Department

THE KNIT GOODS SITUATION

"Strong but quiet" is the expression used to describe the condition in the knit underwear end during the past month. The greater part of the fall buying has been done and although a few orders continue to come along by mail, yet the number of them and the size is comparatively small, and not of sufficient volume to disturb seriously the selling agents in the various offices.

Prices are being advanced on nearly all lines and labor conditions are such as to cause some apprehension on the part of many manufacturers. The help are all demanding more pay and in many cases, manufacturers are granting their demand. In some sections, there is a scarcity of help already, and later when many of the girls will go to the resorts to work in the hotels and boarding houses, the situation will be much worse. Added to this, is the fact that yarn and raw material are steadily advancing in price. Taken altogether, it is easy to understand why manufacturers must have higher prices for their merchandise.

Men's fleeced shirts and drawers have been advanced from 12 1/2 cents to 20 cents per dozen since January. Men's ribbed goods that sold early at $3.12 1/2 are now held at $3.37 1/2, while those that were offered at $3.25 are now priced at $3.40 and $3.50. Even at these advance prices, it is believed that there is no more profit to the manufacturer than on the old prices asked when the season opened.

Women's combed yarn ribbed goods have become somewhat firmer during the month and some of the more well known manufacturers are asking 12 1/2 cents per dozen advance on some of the plain stitch lines.

One of the features is the scarcity of many lines of light weights, more particularly of women's combination suits, the demand for this exceedingly popular garment having been far in excess of any former season.

Another line on which a scarcity exists is men's balbriggans, especially in the lower grades. We are informed by one manufacturer that he was obliged during the past week to decline an order for 75 cases of 25 cent balbriggans on account of being so far behind on the orders now on his books. Those manufacturers who are in a position to deliver any of this class of goods are having no trouble in getting advances of 10 to 15 cents per dozen.

There is a very decided increase in demand for women's vests made with set in shoulder strap, similar to the "Cumfy Cut" lines. It is claimed for a garment made in this way that the straps will not fall off the shoulders and this is a feature that seems to be appreciated by the trade in general. As the making of this style garment is in the hands of but a few people, it is difficult to get quick delivery at the present time.

The call for women's shaped goods has not been as pronounced as in some former seasons. As a consequence, there are several stock lots around the market being offered at lower prices than were asked when the season opened. This is true of long sleeved goods and it is also noticed that there is some accumulation of stocks of ladies' ribbed pants. This is due to some extent to the increased demand for combination suits at the expense of two piece garments.

HOSIERY

The fact that we have had longer winter season than for several years past, has had the effect of increasing the interest in wool and fleeced hosiery for fall delivery. Many buyers have already added to their purchases made during the months of January and February. The increasing cost of raw materials has also helped in this matter, as it has become very evident to buyers that the low prices quoted early could not be maintained.

The market for light weights is distinctively a seller's market. Desirable lines are

scarce, and yarns, especially in the finer counts, are very firm. Stocks in the hands of jobbers are lighter than for several years and it is quite sure that with a short period of warm weather, there will be some scrambling for merchandise. The shortage is felt more keenly on lines of sheer gauze goods, but even the more weighty staple lines are nearly all in a well sold up condition.

We are informed upon good authority that the larger manufacturers of fashioned hosiery are sold up for the entire season and the only available source of supply is the smaller manufacturers with quite a limited capacity.

The demand for white hosiery is being felt in all markets and coming as it does, so much earlier this year than in any former ones, the indications are that the call will be much greater. White shoes and stockings have been worn to some extent during the greater part of the winter and the Southern resorts have given every indication of the coming popularity of white footwear. It is said that the bleaching facilities of many manufacturers are sold up to their limit. The demand for whites is not confined to women's and children's goods. A number of lines of white half hose are being shown and the smart dressers among the men of the cities are taking white mercerized and silk half hose in fairly good quantities.

Silk hosiery continues to play an important part, and as a result of considerable experimenting, plated silk goods, made either with pure or artificial silk are being produced, and are meeting with considerable favor. The great advantage of these goods is that they will wear well, look well and are no higher in price than the low grade silks that have been on the market and on which so much complaint has been made.

The Lawrence Co. of Lowell has announced an increase on all their lines of cotton hosiery of 2 1/2 cents a dozen, and give as reasons for same, the higher cost of raw materials and advances in wages of their help.

SWEATER COATS

Although the business on sweater coats in general has dragged some during the month of April, yet a number of manufacturers claim to have all the business on their books now that they can take care of for delivery during July, August and September.

One thing that will make deliveries drag this year is the fact that a great bulk of the business has been booked on coats with collars of one kind or another. This cuts into the production largely and many makers will not be able to get out anything like the number of dozens that they could of the V neck garments.

Higher prices are being asked on sweater coats of all kinds. Some manufacturers gave notice of advances of $1.00 and $1.50 a dozen on worsted goods to take effect on May first. This gave the trade an opportunity to get under cover at early prices on some lines.

The demand is largely for plain stitch coats and for those made with a Ruff neck, although Byron collars are taken freely.

In men's goods, oxford and maroon are the principal colors, but in women's, white takes the lead with cardinal and oxford following. In misses' and infants' sweaters, cardinal and scarlet are the main colors taken and these two shades constitute about 60 to 65 per cent. of the business.

Shaker knit coats have the call in most markets for men, and coats made on shaker machinery are being shown as low as $15.00 a dozen.

A new coat brought out last month is that shown by the Gilbert Knitting Co. It is a coat made of low grade wool stock with a wide shawl collar and is being sold at $6.00 a dozen. It is believed that many jobbers have placed orders on it.

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On account of the large amount of space given to the Knit Goods Convention and Exhibition in Philadelphia this month, we give less space to the Knitting Department.

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The shipments of cotton piece goods from the United States for the seven months ending July, 1911, amounted to 218,947,000 yards, as compared with 164,979,500 yards in the same period of 1910. For the month of July the figures were 29,816,642 yards, as compared with 26,702,910 yards in 1910.

ELECTRICALLY HEATED HOSIERY DRYING BOARDS

The present movement toward the scientific management of business and the elimination of unnecessary expense has been attended by a more extensive use of electrically heated devices in many industries. The advantages of these devices, such as consuming current only when in use, ease of installation anywhere, freedom from fire hazard, odors, etc., have led to their very general use. For this reason the new electrically heated metal hosiery drying board manufactured by the General Electric Company, Schenectady, N. Y., will interest hosiery manufacturers.

This metal board is of the same shape and size as the wooden boards, and consists of two forms of sheet brass securely clamped

together with the heating unit pressed between them, the winding of the unit being so distributed as to give the proper heating effect over the entire surface of the metal board.

A cast iron base is supplied with each set of boards, and the board, when clamped to this base, is inclined away from the operator at an angle of a little less than 60°. The base, which is mounted permanently on the boarding bench, has mounted upon it a terminal block from which the electric wires are led, through a suitable switch and fuses, to the source of electrical energy. The board is not only removable from the base, but can be clamped to it with the toe pointing either to the right or left, depending upon the style of hosiery to be dried.

A feature of these boards is the seam grooves, a shallow groove extending from heel to base about 1/8 inch from the edge. This greatly facilitates placing the seam when boarding and drying seamed hose, and not only saves time in doing the work but also insures obtaining uniform results with each pair of hose. These boards are divided into rights and lefts, a set consisting of 3 rights and 3 lefts.

The removable tip of the boards for drying ladies' hosiery is also a great advantage, enabling the manufacturer to dry two different sizes on one board, thus reducing the number of boards required. Two tips of different lengths are supplied with each board.

Operating tests extending over a long period of time were made in a large hosiery mill and these showed gains in economy and improvements in results as follows:

The cost of drying was reduced 40 to 50 per cent., while the output per day was doubled. Time was saved, as the time of drying can be reduced to three minutes. Seconds are eliminated as the electrically heated metal board has a permanently smooth finish which eliminates any possibility of tearing the hose.

The quality is improved, for the temperature of the electric board can be closely regulated, which ensures retaining the fine finish on all grades.

Fewer boards required and there are no renewals.

Extra sets of boards are not required, as the hose dry practically as fast as boarded. The metal board is practically indestructible, and breakage can be disregarded. Duplicate sets are not required for the different colors of hose as the metal board does not transmit stains.

The use of the electrically heated boards results in a saving in space and the elimination of high pressure steam.

AN IMPROVED LATCH NEEDLE

The improved knitting needle shown in the accompanying illustration is designed to carry the loop past the pivot pin so that there will be no catching and fraying of the

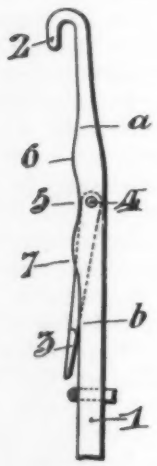

FIG. 1.

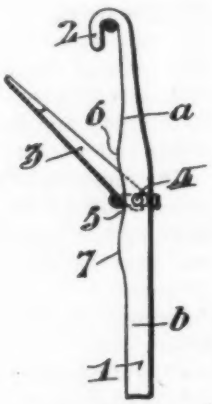

FIG. 2.

yarn if the pin projects from the face of the shank. Fig. 1 is a side view of the needle. Fig. 2 shows the loop passing over the pivot pin. The latch needle consists of a shank, 1, which is formed with a hook, 2, at its upper end. Cooperating with the hook, 2, is a latch, 3, which is pivoted in a groove formed between the side walls of the shank of the needle by a pin, 4. This is the usual type of latch needle. The fabric loops are formed on the needles, and slide down on to the shanks of the needles opening the latches, and as the fabric loops are shed from the needles, the latches close so as to cause the loops to pass over the hook, ends, 2. The pivot pins, 4, for the latches often project beyond the side walls of the needles, catching and fraying the yarn and interfering with the proper action of the needle. The shank of the needle is usually enlarged adjacent the pivot pin for the latch, in order to strengthen the needle, and while the fabric loop is sliding over that portion of the shank adjacent the pivot pin, the loop is under a maximum strain which causes the yarn to lie flat against the side of the needle, and catch on any rough surface.

In the improved form of needle the enlargement in the shank on the front face extends from point, a, above the pivot pin to the point, b, some distance below the pivot pin for the latch of the needle. The outer face of the shank directly in front of the pivot pin, 4, is formed with a depression or concave portion, 5, so that the maximum width of the shank is at the points, 6 and 7, above and below the pivot pin. As the fabric loop slides along the needle shank, it will be drawn by the projections on the front of the shank.

The maximum strain on the loop and the extreme distension thereon occurs at the points, 6 and 7. As soon as the loop passes one of these points, the depression or concave portion, 5, will release the loop from strain, so that the loop will be relaxed as it passes the pivot pin of the latch. If, therefore, there should be a slight roughness at the pivot pin of the latch, the loop will freely pass it, owing to the fact that the yarn is not as tightly stretched against the roughened parts of the needle at this time, as it was before reaching this point.

During the formation of a stitch upon a latch needle, the pivotal point of the needle latch is twice drawn through the loop. The needle after taking the yarn draws it to the stitch forming level where it is then arrested by the web holder or knocking over instrument. The needle is thereupon elevated to a position to take the thread again. During this motion, the upper enlargement, 6, of the needle shank becomes effective in distending the already formed loop, to facilitate the passing of the pivotal point, of the needles.

After the needle has taken the thread for the new stitch, it is again depressed to shed the already formed stitch and in this motion, the lower enlargement distends the loop for the purpose above stated.

The total production of yarn by the cotton spinning mills in India in the fiscal year 1910-11 was 608,306,258 pounds, to which Bombay contributed 424,902,640 pounds.

Dyeing, Bleaching, Finishing, Etc.

STRIPPING DARK SHODDY

BY DR. LOUIS J. MATOS

Stripping the color from dark shoddy is a problem of considerable importance to woolen manufacturers, as an immense amount of reworked or "regenerated" wool finds its way back again into new fabrics. It is the desire to have this particular stock in such a condition that it can be advantageously made use of. To strip or remove the color as dyed, from any kind of woolen material is not an easy matter, for the reason that some colors used by a dyer, even combinations of some colors, are difficult to strip, while the component colors are alone easily taken care of. Also there is no one stripping agent that is absolutely perfect for all kinds of shoddy, and there is no one process that will yield one uniform result on stock that may be treated by it, therefore it is necessary for the manufacturer to treat one or more small batches by several of the well known stripping processes, and make use of the one that does the work most successfully without injury to the fiber.

Woolen material is generally dyed with three classes of colors: acid colors—mostly azo coloring matters; diamine or direct colors, mostly tetrazo bodies; and so-called alizarines that may or may not be true derivatives of anthracene, but which, nevertheless, are dyed upon wool in combination with bichrome.

Of all these three general groups of dyeings, the one most difficult to strip is the last, which resists more or less effectively attempts to remove it by any of the technically available stripping agents or processes. The best that can be done is, at most, to remove the density of the color, at the same time preserve the strength and working qualities of the stock.

Some strippers claim that a certain preliminary treatment of the stock to be stripped materially aids in starting the color, so that the actual treatment with the stripping agent is more thoroughly effective, but in the writer's opinion, based upon a number of years' experience in shoddy, etc., any preliminary treatment is absolutely time and money wasted, and the only effective way to do is to proceed at once with the strip and omit everything else.

Where large quantities of shoddy or other form of wool waste is to be handled, it is most convenient and economical to make a few small trials as previously suggested, and be guided by the results obtained, for it may be that some stock to be treated cannot be stripped at all, and as is very frequently the case, the stripping agent used is unjustly condemned as being worthless, or the process recommended or employed meets likewise very severe and oftentimes adverse criticism. It is therefore very hazardous to recommend any process for shoddy stripping without first making a trial, or at least knowing something as to how the material to be stripped was previously dyed. It is provoking to find in some instances samples of shoddy that strip almost completely from dark shades to very pale tints by a simple process, and on the other hand to have medium shades utterly fail to have a stripping process make the faintest impression.

The following stripping processes are to be recommended for general use, but they should be tried out in the light of what has been written above, and if the results obtained on a given stock show poor results do not condemn the process, but try another one, and keep on until one is worked out that yields the desired result.

Shoddy stripping is not a rule-of-thumb affair at all, and cannot be conducted by empirical rules, but does require some thought and study to be successful at it.

The most common stripping process is to use soda ash. A bath is made with 5 to 10 per cent. of soda on the weight of the material to be treated, the goods entered at 120° F., and worked for twenty minutes.

Some colors, especially if not too full, are materially reduced. Sulphuric acid is used frequently if the colors to be stripped are known to have been dyed with logwood or other dye-woods. From 6 to 8 per cent. of sulphuric acid may be required to produce the desired result.

One of the most generally used processes is as follows. Prepare a bath with:

4% bichromate of potash,
8% oil of vitriol, together with
4% oxalic acid.

Dissolve thoroughly, enter the material, and boil for 1/2 to 3/4 hour. Afterwards rinse well and neutralize.

Hyraldite stripping is now rapidly displacing all other processes for the reason that it is most generally effective, and leaves the wool in the most satisfactory condition. The bath is charged with:

2 to 4% Hyraldite Z,
2 to 5% formic acid of 85% strength,

or if formic acid is not available, to substitute therefor

1 to 2% oil of vitriol.

The material is entered, and the temperature gradually brought to the boil within 1/2 hour, and boiling continued for 1/2 hour. Afterwards thoroughly rinsing and neutralizing, when the shoddy is ready for dyeing. There are a number of products on the market for stripping, several being sold under various fanciful names, which are made of sulphite compounds mechanically mixed with zinc dust, but which do not offer any advantage whatever over any of the processes above mentioned, or the following solution which any stripper or dyer can produce himself, at low cost, and which is very effective. The solution is prepared with:

10 lbs. Zinc dust.
10 gals. water.
10 gals. bisulphite of soda, 70° Tw.

Stir in the zinc dust slowly, letting it settle until the solution becomes clear. For stripping take from 4 to 6 gallons of the clear solution to which has been added 5 pints of commercial acetic acid for each 100 gallons of water. The shoddy is entered into this solution at 140° F. for 20 to 30 minutes and after the stripping is well done it is washed and soured, washed again and then it is ready to be dyed. Hydrosulphite solution is best when prepared fresh and added to the stripping bath just before being used.

VELVET FINISH ON WOOLEN GOODS

By ELMO

Upon some fine cassimeres, and more especially such as have a preponderance of warp on the face, as hair lines, etc., the so-called velvet finish is most desirable. It gives to the cloth a soft and agreeable "feel," which not only catches the attention of the buyer, but is equally pleasing to the wearer, as well as being more durable. The idea of increasing the durability by any process of napping does not seem possible, but it is a fact that the nap upon the face of any cloth protects the fabric. The fibers of the nap resist the wear more completely than if the same fibers were lying in every direction upon the face of the cloth. This is the reason why the cheviot, be it ever so fine, becomes threadbare at the knees and elbows, or where it is subjected to the most friction.

The first requirement in the production of a velvet finish is a well felted cloth, for upon the density of the felt depends the perfection of the nap to be raised from it. This calls for a suitable construction in the loom, so as to allow sufficient fulling to bring about the result desired. The excellence of the work may be enhanced by a shrinkage in length in the fulling, to be governed by the best judgment of the finisher.

When the cloth comes from the washer it should be thoroughly free from dirt or soap. It is then hydro-extracted, care being taken not to run the pieces too long. Much of the water should be left in the cloth, for if it is too dry the fibers will be drawn out in gigging, instead of being raised and retained in the nap. As a rule, the cloth should have all the moisture possible in gigging without appearing wet or glazed on the face during the process. If too wet, it will plainly show, by the nap laying close and appearing

"shiny" from the water on the surface. As it is almost impossible to regulate the moisture to a nicety at the extractor, it is advisable to have the gig fitted with a finely perforated water pipe, where the moisture may be increased during the gigging process. In fact it is often the case that the cloth dries out in running on the gig, and will need attention in this regard.

In the production of the velvet finish, it is important to avoid laying the nap too much in one direction, and to regulate the work so that the fibers will be picked up rather than "dragged out" from the goods. It is impossible to give any definite rules to the process, but the cloth should be frequently turned, so as to change the direction of the nap; and the number of turns depends upon the amount of gigging required. The work should begin with well worn teasels, so as to avoid drawing out the fibers, which will be very easily done at first. Following this, better teasels should be substituted, being careful not to make too marked a change in the quality. It is important to have the better work well separated in the cylinder. If the cylinder holds 24 slats, or teasel frames the slats should be arranged in sets of six or eight,—six is best. When a set is put in, a new slat will be the fourth in the cylinder. One of these picks up the nap and lets go, and is then followed by another. This produces better work than if the better teasels were more closely together in the cylinder, in which case there would be a continual drag, rather than a picking up. When a still better grade of teasels is introduced, put the slats midway between those last put in. This gives better slats in every other space. Follow this method until the proper nap is produced. The direction of the nap may be changed at the introduction of better teasels, except the first time. The first or poorer teasels will not produce sufficient nap to require a change. If the gig cylinder is reversible, the nap may be changed in that way. If a cylinder is used, running the cylinders in opposite directions will answer, finishing with both cylinders in the same direction for one or two runs. For fairly heavy goods start by gigging toward the tail end of the cloth, and finish when running toward the head end the second time. Plan to complete the making of the nap before changing the last time, and use this last change simply to turn the nap, and run only to do that. This leaves the nap as nearly standing as will insure good work when it comes to the shearing.

Where the wire napper is used, the finisher should be able to produce the same results, if he understands regulating and adjusting the machine. This machine accomplishes the work more upon the "picking up" principle, and does not lay the nap so well as the gig does. For this reason less turning of the nap will be required. By napping sufficiently to properly clear up the pattern, and then turning the nap with the least possible amount of work, as in the case of the final turning on the gig, good results are secured. The dry-beating should follow, the same as when gigged, as this gives to the nap a desirable fluffiness.

While I believe the best results can be secured by the use of the teasels, when accompanied by skill and good judgment, the napper has its advantages. One of these is that it relieves the finisher of the necessity of keeping up the grade of work, to offset the constant wearing out of the teasels. As the wire can be relied upon to repeat its work, the finisher should be able to accomplish results more nearly by rule than with the gig.

When the cloth has been dried it should be given a few runs of "dry-beating." For this purpose the old style up-and-down gig is the best. While it is customary in dry-beating to use the poorest of teasels, for this work I would advise a medium grade. Let it have several runs with the least tension possible, and this will lift and soften up the nap without really gigging it any. With the poorer teasels, more tension would be required. This would tend to lay the nap, which should be avoided.

In shearing, be sure that both the raising and laying brushes are in good working order. Do not lower the blades too fast, and be sure to leave sufficient nap to give a soft velvety touch, giving several runs at the

same notch to finish. Instead of shearing down to what would seem right, hold off another notch and give several runs. This will often result in showing up the pattern just as well, and leave a more velvety surface on the cloth. Press well with face to the press bed. This will produce a sharp feeling to the nap, with little appearance of velvet; but steaming will restore it. In steaming, it is desirable to act upon the nap, with as little effect as possible upon the body of the cloth. To this end it is necessary to reduce the force of the steam, which can be done by a felt covering over the steamer on the brush. The ordinary covering is not always sufficient, especially after it has been in use for some time. It should hold the steam in check so that as it comes through the felt it will come up gently, like a hot fog. Such a steaming is as effective on the nap, and the steam does not penetrate the fabric, thereby destroying the pressing effect in the cloth. The water of condensation should be run from the pipes before steaming, and no water allowed to get on the felt covering, for this will obstruct the steam and result in uneven steaming. Only sufficient steam should be used to destroy the gloss upon the face of the cloth. The brushes should be fairly well applied to the cloth while steaming, and this will complete the work of lifting the nap, so that the "barby" feel of the more ordinary finish will not be in evidence; in its stead there will be a soft velvety handle. The extra pains taken to secure this finish will be found well worth while where the velvet finish is desired.

SUCTION DYEING MACHINE

An automatic dyeing machine in which the circulation is maintained by suction rather than pressure is shown in the accompanying illustration. It is a German invention recently patented in the United States and is described as follows: This apparatus comprises a carrier for the textile materials and a bell for removing the air from the material to be dyed. The pressing apparatus differs from others in the use of suction, rather than pressure for causing the dye liquid to circulate through the fabric. Fluid under pressure tends to separate the material; under suction it tends to unite the material. Mechanical fastening is an essential element in a fluid-tight joint, subjected to internal pressure, and in order to disunite such joints, physical force must be exerted. Where suction is exerted within a hollow tube or chamber having joints, the tendency is to bind the

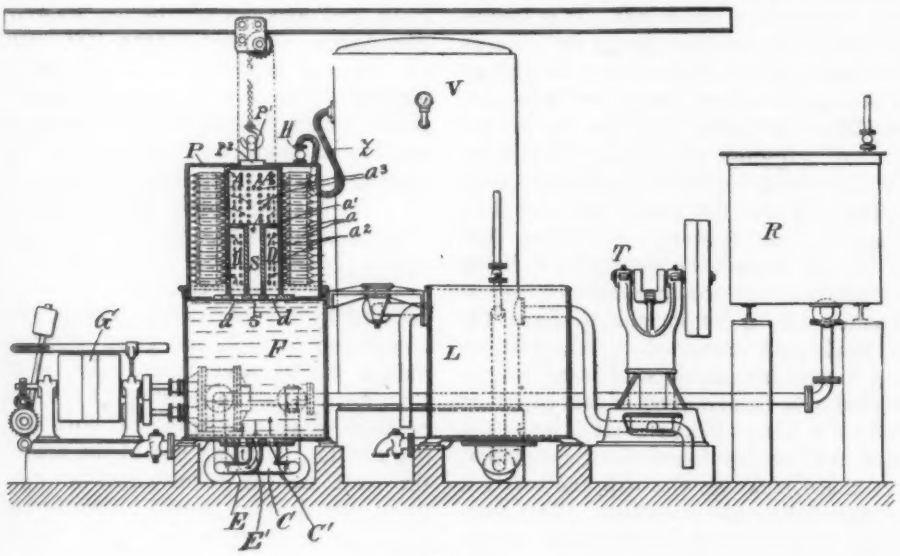

FIG. 1.

joints more closely and firmly together. The principle of suction is therefore employed in this machine for the two-fold purpose of providing a joint, of maximum efficiency, between the tank, which holds the liquid dye, and the pipes through which the dye circulates; and to provide such a joint, that requires only a release from suction and from the pressure resulting from gravity, for disconnecting the joint.

Fig. 1 is an elevation of the machine, certain parts being shown in section. Fig. 2 is a top, plan view of the tank, the pump and connections.

ter with the openings, d and S', respectively, when the bell and carrier are lowered into the tank, F. A suction pump, G, is connected with the openings, E' and C', by suction and delivery pipes, E' and C', respectively, so that when the openings, d and S' are in registration with the openings, C' and E', and the bottoms of the pipe, S, and carrier, B, rest upon the bottom of the tank, communication is established between the pump and carrier, which is provided with perforations, a^2 and a^3. The flexible pipe, Z, communicates with the interior of the bell and with a vacuum tank, V. A stop cock, H,

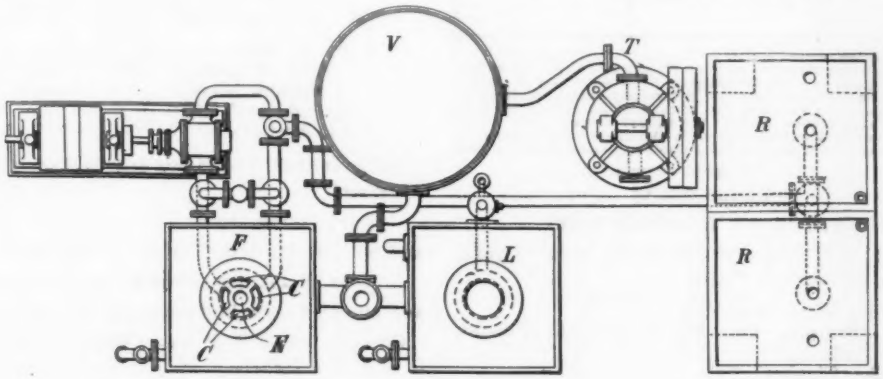

FIG. 2

A carrier, A, is provided for holding the material to be dyed, which is here represented by spools or bobbins of yarn or the like, at a. The carrier, A, is cylindrical, the top being closed, and the bottom having an annular opening, d. In the cylinder is the horizontal partition, a', having a central opening. A pipe, S, registering with the opening, extends to the same horizontal plane as that of the bottom of the carrier, A, forming an annular space, D, between the carrier and the pipe.

A bell, P, which covers the carrier, may be arranged for raising and lowering, with relation to the carrier, for convenience in placing and removing the material. The raising and lowering device is shown at P'. At P^2 there is a fluid-tight joint between the bell and the carrier. A tank, F, of sufficient size to receive the bell, has openings, C' and E' through the bottom, and is adapted to regis-

is interposed between the pipe, Z, and the vacuum tank, for establishing or interrupting suction through the pipe, Z.

The carrier, B, is first loaded with the material to be dyed, and the tank, F, is supplied with the proper amount of dyeing fluid. The bell, P, is seated on the carrier as shown. The bell and carrier are lowered into the tank, until they are seated on the bottom, and the openings, S' and d, register with the openings, E' and C', respectively. During the operation of lowering the bell, the cock, H, is opened, so that the air therein gives place to the dyeing liquid. The suction, produced by the vacuum means, should be sufficient to so rarefy the air in the bell so that the dyeing liquid has free access between the fibers. This vacuum causes the external pressure of the air to seat the carrier more firmly on the bottom of the tank and produces a tighter connection between the open-

ings, S', d and E', C'. This tightening effect is increased by the action of the suction pump, G, which causes the dyeing liquid to circulate through the pipes, E and C, and through the carrier, B, pipe, S, and annular space, D, in the direction indicated by the arrows, owing to the outlet, S', being less commodious than the inlet, d, and therefore offering greater resistance to the downward current than is offered to the upward current.

Dye Recipes

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation. Subscription price for the Dyers' Supplement $1.00 per year.

Recipe No. 65

YELLOW ON WORSTED YARN

Wool Fast Yellow G on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Wool Fast Yellow G.
(Badische Co., 86 Federal St., Boston, Mass.)
20 lbs. Glauber's Salt.
3-5 lbs. Sulphuric Acid.

Enter at 140° F. and dye at a boil for one hour.

Wool Fast Yellow G possesses exceptionally good fastness, for an acid dyestuff, to washing and milling.

Recipe No. 66

RED ON WORSTED YARN

X. L. Carmosine 6 B on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. X. L. Carmosine 6 B.
(Read Holliday & Sons, 11 Gold St., New York.)
20 lbs. Glauber's Salt.
5 lbs. Sulphuric Acid.

X. L. Carmosine 6 B possesses excellent fastness to light and milling.

Recipe No. 67

BLUE ON WORSTED YARN

Sulphon Cyanine G R T on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Sulphon Cyanine G R T.
(Farbenfabriken Co., 117 Hudson St., New York.)
5 lbs. Ammonium Acetate.
10 lbs. Glauber's Salt.

Enter at 120° F., raise very slowly to a boil and boil until the dye bath is exhausted. If the bath does not exhaust after one hour's boiling add

2 lbs. Acetic Acid.

Care must be taken that the bath remains in a slightly acid condition throughout the entire dyeing process.

Sulphon Cyanine G R T possesses very good fastness to light, rubbing, washing and milling.

Recipe No. 68

BROWN ON WORSTED YARN

Chrome Brown V P on 100 lbs. worsted yarn. Prepare the dye bath with

5 lbs. Chrome Brown V P.
(F. E. Atteaux & Co., 174 Purchase St., Boston, Mass.)
10 lbs. Glauber's Salt.
5 lbs. Acetic Acid.

Enter at 120° F., and dye at a boil for 1/2 hour. Then add

5 lbs. Acetic Acid,

and boil for 1/2 hour longer. Finally add

3 lbs. Potassium Bichromate,

and aftertreat at a boil for 3/4 of an hour.

Chrome Brown V P leaves silk fiber white, and is therefore largely used in piece dyeing of material containing silk illuminations.

Chrome Brown V P is somewhat sensitive to copper and should not be dyed in copper vessels.

Chrome Brown V P can also be dyed as a chromate color.

Recipe No. 69

BLACK ON COTTON YARN

Columbia Fast Black F Extra on 100 lbs. cotton yarn. Prepare the dye bath with

4 lbs. Columbia Fast Black F Extra.
(Berlin Aniline Works, 213 Water St., New York.)
20 lbs. Glauber's Salt.
2 lbs. Soda Ash.

Enter at 180° F., and dye at a boil for one hour. Then rinse, and couple with diazotized para nitroaniline in a bath made up with

1½ lbs. Para Nitroaniline.
4 lbs. Hydrochloric Acid 32° Tw.
1½ gals. Water (boiling).

When the neutralization of the paranitroaniline with hydrochloric acid is complete, add

4 gals. Cold Water.

When perfectly cool add

1¼ lbs. Sodium Nitrite,

which has been dissolved in 1 gallon of cold water.

Then make the whole bath up to volume necessary for convenient working of the material. After working in this bath for 1/2 hour, rinse thoroughly, and dry.

Columbia Fast Black F Extra when dyed and coupled in this manner, will be found to possess very good fastness.

Recipe No. 70

ORANGE ON WORSTED YARN

Chrome Orange W D on 100 lbs. worsted yarn. Prepare the dye bath with

5 lbs. Chrome Orange W D.
(F. E. Atteaux & Co., 174 Purchase St., Boston.)
10 lbs. Glauber's Salt.
5 lbs. Acetic Acid.

Enter at 120° F., and dye at a boil for 1/2 hour. Then add

5 lbs. Acetic Acid,

and boil for 1/2 hour longer. Finally add

3 lbs. Potassium Bichromate,

and aftertreat for 3/4 of an hour at a boil.

Chrome Orange W D leaves silk fiber white, and is therefore largely used in piece dyeing of material containing silk illuminations.

Chrome Orange W D can also be dyed as a chromate color.

Recipe No. 71

BLACK ON COTTON YARN

Diamine Fast Black C Highly Conc. on 100 lbs. cotton yarn. Prepare the dye bath with

4 lbs. Diamine Fast Black C Highly Conc.
(Cassella Color Co., 182 Front St., New York.)
20 lbs. Glauber's Salt
2 lbs. Soda Ash.

Dye for one hour at a boiling temperature. Rinse and aftertreat in a bath made up with

3 lbs. Formaldehyde,
1½ lbs. Potassium Bichromate,

for 1/2 hour at a temperature of 160° to 175° F.

Diamine Fast Black C High Conc. possesses very good fastness to light and when aftertreated with formaldehyde and potassium bichromate its fastness to washing is considerably increased.

Recipe No. 72

YELLOW ON WORSTED YARN

Fast Acid Yellow 3 G on 100 lbs. worsted yarn. Prepare the dye bath with

1 lb. Fast Acid Yellow 3 G.
(Cassella Color Co., 182 Front St., New York, N. Y.)
10 lbs. Glauber's Salt.
5 lbs. Sulphuric Acid.

Enter at 140° F., and dye at a boil for one hour.

Fast Acid Yellow 3 G possesses a very high coloring power and great brilliancy.

Recipe No. 73

PINK ON COTTON YARN

Thio Indigo Rose B N Paste on 100 lbs. cotton yarn. Prepare the dye bath with

1 lb. Thio Indigo Rose B N Paste.
(Kalle & Co., 530 Canal St., New York.)
2½ lbs. Hydrosulphite Powder.
4 lbs. Caustic Soda Solution 72° Tw.

The temperature is raised to 140° to 160° F., until the color is reduced, which will be shown by the clear yellow color. The dyeing should be conducted at a temperature between 100° to 120° F. After dyeing for from 1/2 to 3/4 of an hour, the material is rinsed and boiled in a soap bath for 1/2 hour.

Thio Indigo Rose B N Paste possesses high coloring power for a vat color and also possesses excellent fastness to all color destroying influences.

Recipe No. 74

BLACK ON COTTON YARN

Diamine Fast Black C B Highly Conc. on 100 lbs. cotton yarn. Prepare the dye bath with

4 lbs. Diamine Fast Black C B Highly Conc.
(Cassella Color Co., 182 Front St., New York.)
20 lbs. Glauber's Salt.
2 lbs. Soda Ash.

Dye for one hour at a boiling temperature. Rinse and aftertreat in a bath made up with

3 lbs. Formaldehyde,
1½ lbs. Potassium Bichromate,

for 1/2 hour at a temperature of 160° to 175° F.

Diamine Fast Black C B High Conc. possesses very good fastness to light and when aftertreated with formaldehyde and potassium bichromate its fastness to washing is considerably increased.

Recipe No. 75

BROWN ON COTTON YARN

Thio Indigo Brown 2 R Paste on 100 lbs. cotton yarn. Prepare the dye bath with

25 lbs. Thio Indigo Brown 2 R Paste.
(Kalle & Co., 530 Canal St., New York.)
5 lbs. Caustic Soda.
4 lbs. Hydrosulphite Powder Conc.

This mixture is well stirred at a temperature of 140° F., until reduction is complete. The dyeing is then carried out at a temperature of 120° to 140° F., for one hour.

Thio Indigo Brown 2 R Paste possesses good fastness to washing, with fair fastness to light. Its fastness to chlorine, however, is not equal to the other Thio Indigo colors. In a standing bath, only 60 per cent. of the original amount of dyestuff is necessary.

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Recipe No. 76

BLACK ON WORSTED YARN

Chrome Black 47 on 100 lbs. worsted yarn. Prepare the dye bath with

6 lbs. Chrome Black 47.
(Read Holliday & Sons, 11 Gold St., New York.)
10 lbs. Glauber's Salt.
5 lbs. Acetic Acid.

The cloth is entered in a cold bath and brought to a boil in from 3/4 to 1 hour. Boil 1/2 hour. Then add

1 lb. Sulphuric Acid,

well diluted with water and continue boiling for 1/4 of an hour, when

2 lbs. Bichrome

is added and boiling continued for another hour.

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Recipe No. 77

BLUE ON COTTON PIECE GOODS

Tetrazo Fast Blue 2 B on 100 lbs. cotton piece goods. Prepare the dye bath with

3 lbs. Tetrazo Fast Blue 2 B.
(American Dyewood Co., 84 William St., New York, N. Y.)
20 lbs. Common Salt.

Give ten or twelve runs and rinse.

Tetrazo Fast Blue 2 B is of exceptional fastness to light, and recommended for the dyeing of yarn or cotton piece.

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Recipe No. 78

YELLOW ON COTTON PIECE GOODS

Tetrazo Chlorine Yellow G on 100 lbs. cotton piece goods. Prepare the dye bath with

2 lbs. Tetrazo Chlorine Yellow G.
(American Dyewood Co., 84 William St., New York, N. Y.)
20 lbs. Common Salt.

Give ten or twelve runs and rinse.

Tetrazo Chlorine Yellow G is of exceptional fastness to light, and recommended for the dyeing of yarn or cotton piece.

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Recipe No. 79

BLUE ON WORSTED CLOTH WITH SILK ILLUMINATION

Fast Chrome Navy Blue N X on 100 lbs. worsted cloth with silk illumination. Prepare the dye bath with

3¾ lbs. Fast Chrome Navy Blue N X.
(C. Bischoff & Co., 451 Washington St., New York.)
10 lbs. Acetate of Ammonia.
15 lbs. Acetic Acid.

Enter at 120° F., and dye at a boil for 1 hour. Then after-chrome in a separate bath made up with

2 lbs. Potassium Bichromate.
6 lbs. Acetic Acid.

Fast Chrome Navy Blue N X will not only be found an excellent chrome color for straight dyeings, but is especially useful in piece dyeing material containing silk illumination.

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Recipe No. 80

GREENISH BLUE ON COTTON YARN

Rhoduline Blue 6 G on 100 lbs. cotton yarn. First mordant the yarn in a bath made up with

4 lbs. Tannin,

or a corresponding amount of stainless shumac extract by working in a boiling bath for 1/2 hour, and then allowing to remain in the cooling liquor for several hours and over night if possible. Squeeze without rinsing, and work for 15 to 20 minutes in a cold bath made up with

2 lbs. Tartar Emetic.

Then wash, and dye in a fresh bath made up with

2 lbs. Rhoduline Blue 6 G.
(Farbenfabriken Co., 117 Hudson St., New York.)
½-1 lb. Acetic Acid,

depending upon the hardness of the water.

Rhoduline Blue 6 G gives a decidedly greenish shade of blue and will be found a valuable color in calico printing on account of its good fastness for a basic color, and also because it is easily discharged to a pure white.

New Machinery and Processes

This department is designed to present from month to month a brief mention of new machinery, devices and processes being brought out in this country and abroad, that are of interest to the textile manufacturers. It is not a list of patents but of improvements on the market, the idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.

Whenever possible we endeavor to make a personal investigation of the new machinery and processes described in this department. In the absence of such personal investigation we must necessarily rely upon information obtained from those who control the machines and processes.

We invite machine builders and others to send us such information for this department.

Chinchilla Machine. The Curtis & Marble Machine Co., Worcester, Mass., are about to place on the market an improved chinchilla machine embodying a number of ideas which will be of interest to manufacturers of chinchillas.

Label Stitching Machine. The Rose Label Machine Co. of Grand Rapids, Mich., have made a number of improvements in their machine designed for sewing labels onto underwear, knit goods of all kinds, garments, etc. The improved machine requires no attention whatever from the operator after the label has been placed, as the machine sews automatically around the label, stops at the last stitch, and with the needle up releases its own thread so that all the operator has to do is to remove it.

Counting Machine. W. N. Durant & Co., Milwaukee, Wis. An improved counting machine which is described in another part of this issue.

Thread Breaker- Pietro Saracco, Saluzzo, Italy. A device for twisting machines by which the yarn is automatically broken back of the rollers when the corresponding ply thread breaks in front of the rollers.

Jacquard Head Motion. Wilhelm Koehler, Aue, Saxony. An improved head motion for jacquard machines, the cards being moved by a cylinder.

Evener for Looms. C. L. David, Reims, Germany. A compensating attachment for preventing thick and thin places in the cloth due to irregularity in the number of picks per inch.

Card Clothing. J. J. Gillet, Aachen, Germany. An improved fabric used for the foundation of card clothing. It has been tested with good results in German mills.

Card Feed. C. O. Liebscher, Chemnitz, Germany. An improved feed for first breaker cards.

Changing Speed of Ring Frames. Berlin-Anhaltischen Maschinenbau-Aktien Gesekkschaft, Dessau, Germany. A device for changing the speed of ring frames. It is said to be giving good results in German mills.

Cutter for Broche Looms. Mechanische Broschierweberei Elsterberg, Elsterberg, Germany. An apparatus for cutting the floating threads of broche fabrics before the goods are removed from the loom.

Plush Loom. H. W. Kretschmann, Jr., Eisenberg, Germany. A plush loom in which two rods are inserted simultaneously to form the pile. Two separate sheds are formed to receive the rods.

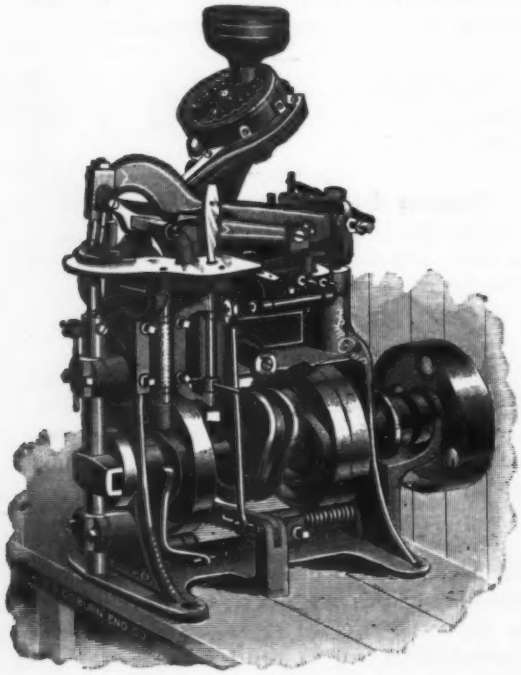
Bobbin Holder. Carl Zimnic, Erzsebetfalva, Hungary. An improved device for holding the bobbin on the spindle of jute and hemp spinning frames.

Heilmann Comb. Nicholas Schlumberger & Co., Gebweiler, Germany. An improved drawing-off motion for Heilmann combs.

Shuttle for Ribbon Looms. Emil Luebeck, Barmen, Germany. An improved shuttle for ribbon looms which is said to offer important advantages over the type now in use.

AN EYELETTING MACHINE FOR KNIT GOODS

The Merrick power eyeletting machine, supplied by the United Shoe Machinery Company, Boston, will commend itself to every manufacturer of knit goods that require eyeletting. It is claimed to be the only machine for this purpose which does not cut the fabric. The importance of this feature will be readily appreciated by all who have had experience in



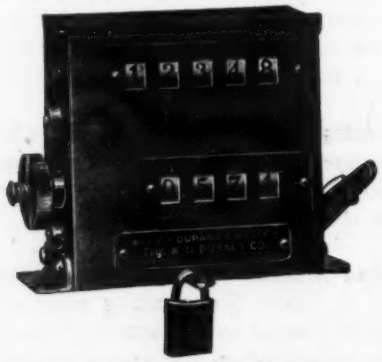
AN EYELETTING MACHINE.

setting eyelets in fabrics, for, as the fiber is not injured, there is no fraying or pulling away from the eyelet, which is set securely by this machine. In operation, the goods to be eyeletted are placed on the table of the machine, under a presser foot. Pressure on the treadle starts the machine, and the arm carrying a blunt point descends, separating the fibers of the material, and also forcing its way through slides in the table of the machine, which push the fabric up on to the shank of the piercing point. This point then automatically carries it to the left, over the under sett carrying the eyelet. The two come together when the eyelet is set securely in the fabric. The eyelets are fed automatically down a raceway, and the spacing can be varied in distance up to 1 1/8 inches.

The machine is under absolute control of the operator, and can be made to set any desired number of eyelets with equal spacing, from one up. The setts are accurately made and do not split the edge of the eyelet in setting. The machine is carefully and substantially built, and the spare parts required through wear or accident may be promptly secured through branch offices of the United Shoe Machinery Company, located in all the principal manufacturing communities, where a complete stock of the eyelets required by the knit goods trade may also be found.

THE DURANT MODEL "E" COUNTER

The demand for special forms of counters for peculiar uses has led the W. N. Durant Co., 523 Market St., Milwaukee, Wis., to bring out a new device shown in illustration,



THE DURANT MODEL "E" COUNTER.

which is called their model "E" counter. Its purpose will be readily recognized as providing a row of figures for recording totals of operations, and another for tallying short runs or parts of a complete run. The figures in the totalizer cannot be reset without unlocking the lid of the case, while the shorter row can be reset to "0" instantly by a single turn of the large thumb nut at left of case. There are hundreds of widely varying uses for counters where a machine of this

type will have considerable time and figuring and many manufacturers have already found them very valuable.

The Model "E" Durant Counter has been made in its present form for some time past and is said to give absolutely dependable service, even under very severe conditions. It is made with two forms of the resetting device, both of which are included within a single case in Model "E." It is, therefore, practically two complete counters driven by a single lever and capable of being independently reset. A full description of this machine is included in the catalogue of the manufacturers, and a copy will be sent on application.

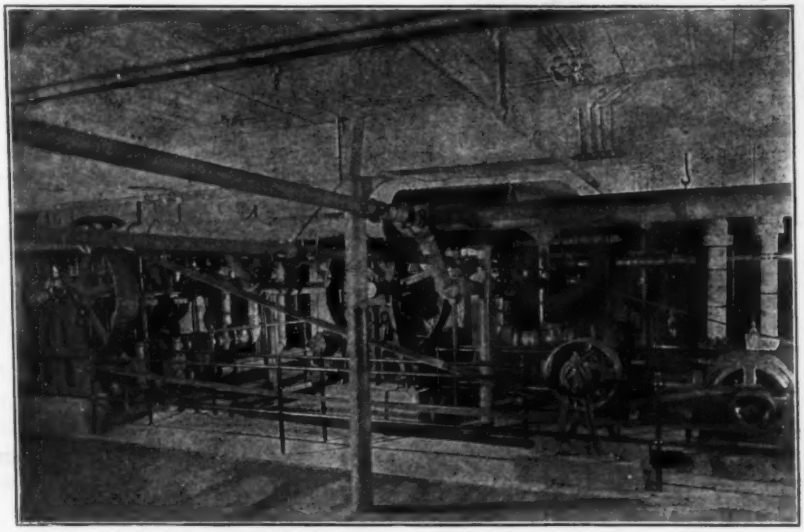
THE PACIFIC MILLS HUMIDIFYING SYSTEM

Throughout all departments, The Pacific Mills of Lawrence, Mass., present one of the best examples of modern textile mill construction. The equipment for keeping the atmosphere at the proper humidity for textile mill work is one of the largest equipments of this kind.

Four buildings are served by this system, as follows: A seven-story cotton mill with 141 heads, a two-story weave shed with 107 heads, a six-story worsted mill with 339 heads, a three-story cotton yarn mill with 77 heads, giving a total of 664 heads. These are all Comins sectional heads, and were installed by the American Moistening Company, forming one of the largest system ever installed by them.

Water is supplied these heads from a central pumping station located in the basement of the cotton weave shed. The interior of this station is shown in the illustration herewith.

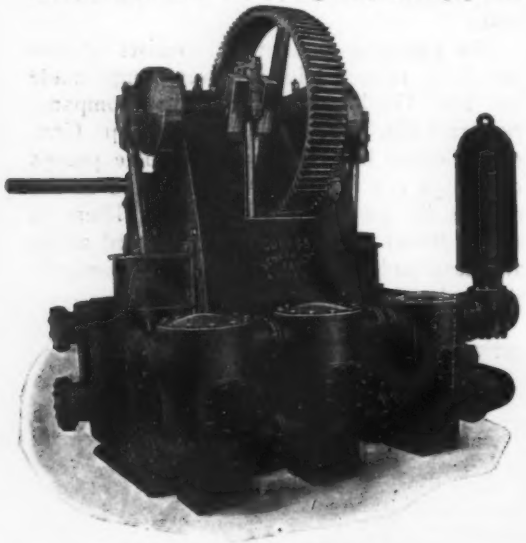
The pumping equipment consists of two 9-inch by 12-inch triplex power pumps made by The Goulds Manufacturing Company, Seneca Falls, N. Y., driven by 50 h. p., General Electric induction motors. The pumps run at 32 r. p. m. and are connected to the motors by 12-inch double belts. There is also a steam pump which is also used as an auxiliary only, as much better economy is shown by the triplex power pumps.



THE GOULDS PUMPING EQUIPMENT AT THE PACIFIC MILLS

Each pump has a 7-inch check valve, a 6-inch gate valve and a 5-inch by-pass valve on the discharge side; no foot valves are used. The pressure carried on the system is 140 pounds to the square inch. If the amount of water needed is nearly equal to

the amount which can be supplied by the triplex pumps, working either both or one of the pumps, the pressure on the system is controlled by the by-pass in the pump. If the amount needed is smaller than the capacity of one triplex pump, or larger than the capacity of one and not large enough for both, the small extra amount required is made up by using the steam pump, and the pressure is regulated by a Mason pump pressure regulator. Each pump has an 8-inch suction and delivers through a 7-inch pipe to



THE GOULDS TRIPLEX POWER PUMP

a steel air chamber; the three air chambers being so arranged that whatever pumps there may be in service, they will work on all three air chambers. From the air chamber the water is led to an 8-inch main which distributes it to the various heads.

Each head is supplied with 85 gallons of water per hour, 2 gallons of which is evaporated. This gives a duty of nearly 1,000 gallons per minute on the pumps. Usually enough heads are shut off so that one of the triplex pumps only is in operation, using from 45 to 50 h. p. As the total cost of power including operating pressure and fixed charges is less than 1 cent per k. w. hr. in this plant, this represents an operating cost of about 35 cents per hour for the pumping equipment.

The pumps draw their water from a reinforced concrete tank with a capacity of 6,500 gallons. This tank is divided into compartments by perforated copper screens in such a way that the water returning from the heads is filtered twice before reaching the pump again. The suction pipes of the pump are so designed that the water is drawn from as low a level as possible, and also that the water is drawn downward instead of up from the bottom of the tank. The water evaporated by the system is replaced through a 4-inch ball cock on a city water line.

The pumps are installed directly over the tank, and are supported by steel I-beams which are imbedded in the walls and covered with concrete.

THE CARRIER HUMIDIFYING SYSTEM IN THE PLANT OF THE STETSON COMPANY

A close and uniform texture is essential in the manufacture of high grade bands for men's hats. The Stetson Company, Philadelphia, Pa., manufacture seven million yards of this material, all of which is used on Stetson hats, and special attention is given to the moistening of the air of the workrooms so that a ribbon of high quality and close texture may be obtained. Each loom has a capacity of about twenty yards of banding per day, and owing to the close texture and the high tension under which the yarn is woven, it is necessary to regulate carefully the humidity of the air in order to obtain good work. In the early days of this industry, and before the advent of the automatic humidifier, Mr. Stetson realized the bad effect of the ordinary variations of atmospheric conditions and with characteristic individuality sought to supply moisture to the air by transferring the potted plants in his conservatory to a mound in the center of his weave room. By keeping the flowers watered the evaporation tended to moisten the air of the room. This novel method of humidifying the air later gave way to a moistening system and this has now been replaced by the Carrier automatically controlled humidifying apparatus, which is shown in the accompanying illustrations, made by the Carrier Air Conditioning Co. of America, 39 Cortlandt St., New York. Fig.

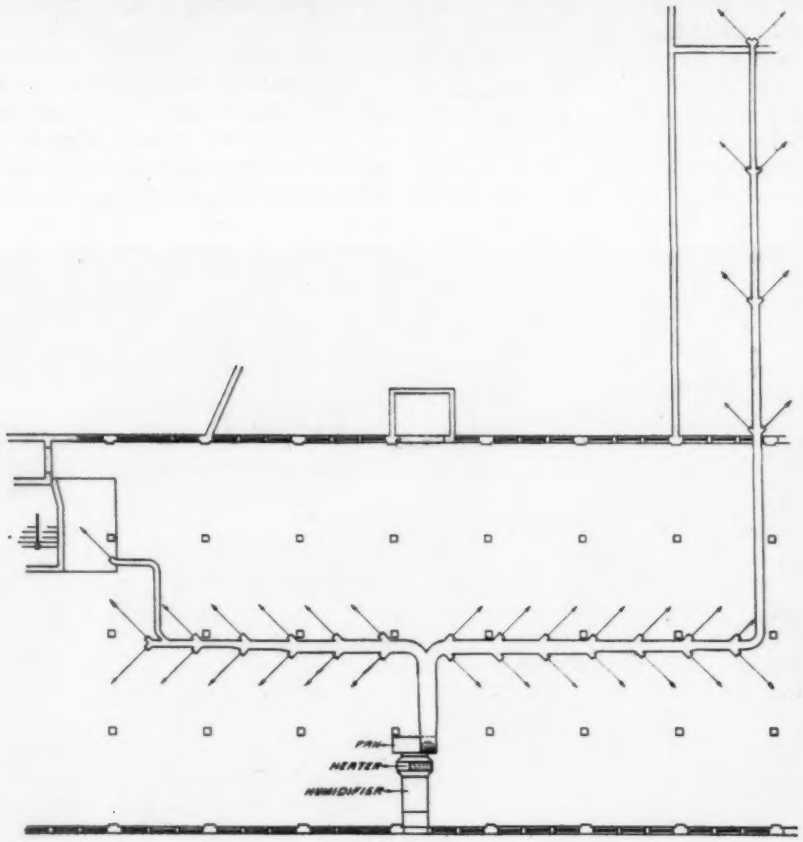


FIG. 1.

1 is a plan showing the arangement of the humidifier heater, fan and piping. The air is drawn either from the room or from the outside of the building and passed through a spray chamber where it is saturated with moisture. The air is then heated by steam coils in winter and distributed through the ducts to all parts of the weaving, winding, finishing and storage rooms, as shown in the plan.

A differential thermostat in the weaving room automatically keeps the humidity at 65 per cent. The method of control consists in regulating the weight of the water vapor mixed with the air in the spray chamber and dampers in the air intake.

The positive distribution of the humidified

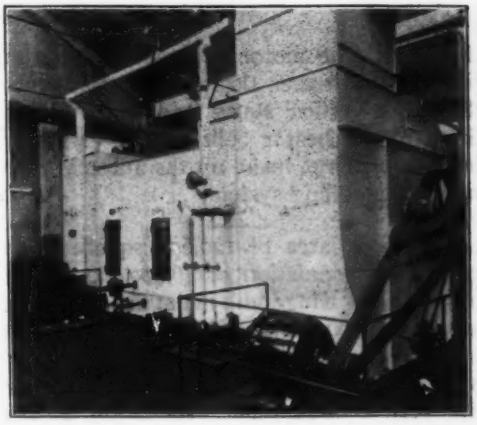


FIG. 2.

atmosphere is accomplished by means of a large Buffalo centrifugal fan, delivering 34,000 cubic feet of air per minute, which is attached to the outlet of the humidifier. A very clear conception of the appearance of the remainder of the apparatus may also be obtained from the illustrations, Figs. 2 and 3. The glass windows look into the spray chamber. The motor and centrifugal pump circulate the water through the spray nozzles. The vertical steam leads show the position of the heater coils. The various air valves, air pump, make up the automatic humidity controlling system.

On a total area of 120,678 square miles, and with a population of 46,000,000 people, the United Kingdom maintains approximately 33,000,000 sheep. This means one sheep on every two acres of land and one to each 1 1/4 persons of the population. Even with such a large home production, 40 per cent. of which is estimated to be slaughtered annually, it is necessary to import large quantities of foreign and colonial meats.

A GOVERNMENT PLANT FOR SHRINKING CLOTH

The new shrinking plant of the United States Quartermaster's Department, located at the Schuylkill Arsenal, Philadelphia, where all the uniform cloth, convict suits and overalls for the United States War Department

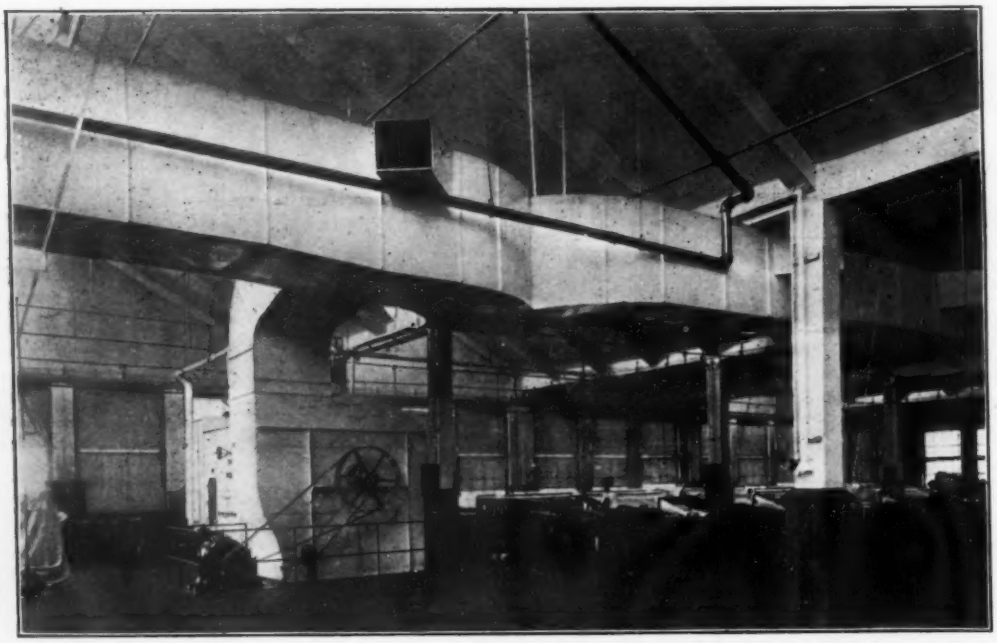


FIG. 3.

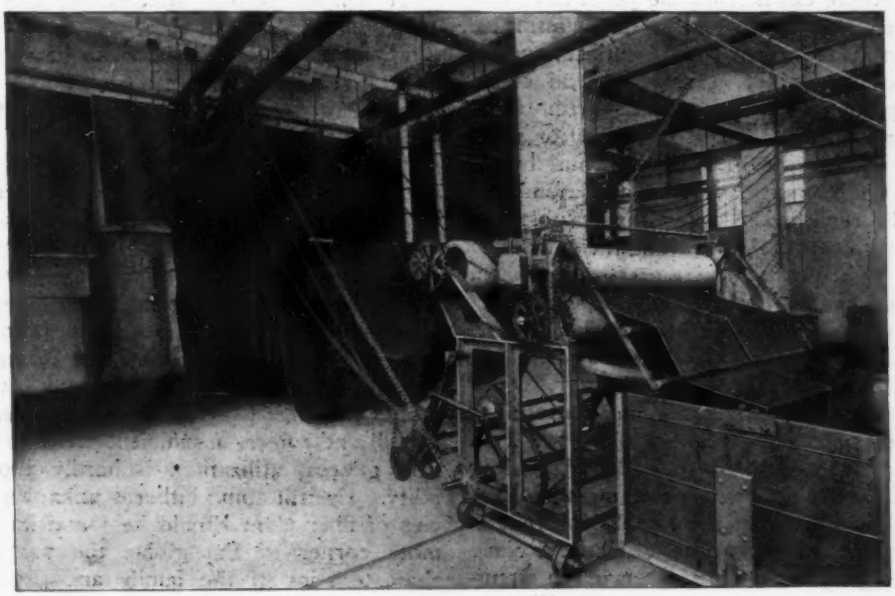
are shrunk, has created great interest among manufacturers all over the country and been visited by representatives from the largest textile mills in New England and the South.

The increased efficiency has resulted in a large saving in this department, the saving per yard on cotton goods being $.006 and on woolens $.02. Fifteen thousand yards is the daily capacity of the plant, it being the largest in the country and the pioneer in shrinking on a large scale.

The cotton goods are saturated with water in tubs and then drained. They are then run through squeeze rolls to eliminate the surplus water and hung on racks automatically. The racks space the cloth with four inches between the folds, allowing plenty of air

space for uniform shrinking. The heat is furnished by steam radiators placed on the floor. This dries the bottom of the fold first and prevents stretch caused by the weight of the water which would accumulate at the lower end of the fold.

When the goods are dry they are taken down by an automatic plaiting down machine, which plaits the goods on movable platforms in yard folds. The goods are then taken to a machine which winds them and measures them. The machine shrinking is made with a cast-iron frame and two cast-iron squeeze rolls. The hanging device is attached to the rear of the machine and the entire system is driven by a five h. p. motor geared direct. No. 52 chain is used in the racks to carry the cloth. This chain is equipped with special safety attachment links which prevent the cloth from being dropped. It is figured that the saving effected by the machine was sufficient to pay for the installation in three months. The equipment was furnished by the Reliance Machine Works, Frankford, Phila.



THE SHRINKING PLANT OF THE RELIANCE MACHINE WORKS FOR THE UNITED STATES QUARTERMASTER'S DEPARTMENT.

WONDERFUL NEW FIBERS

BY CHARLES RICHARDS DODGE

Every once in a while we read of the "wonderful" discovery of some "new" fiber plant, the utilization of the fiber of which, it is claimed, will revolutionize some particular textile industry. But the fiber industries of the world have been revolutionized so many times in this manner that the use of scare heads, bold-faced type and superlatives do not create more than a passing interest in these startling announcements.

There was that wonderful discovery of the new linen plant, in Brazil, not long ago, the fiber of which was to drive Irish and Courtrai flax out of the market. Expert examination proved it to be merely a jute substitute—a plant known in India from time immemorial, and duly recorded, at its proper rating, in all of the text books published in the past century. But sometimes it is not a new plant, but a new process—heralded to convert seed flax-straw of doubtful value, for instance, into high grade line, in the "twinkling of a bed-post."

These remarks are suggested by the recent announcement of the discovery of a new species of Asclepias, and here in the United States, where, it has been supposed, botanical science had long ago listed and described everything green, particularly the members of so well known a genus as Asclepias. We have had the milk-weeds with us always, and the gray filaments of fiber streaming in the wind from dead stalks in the field, as well as the silk-like down from the pods, have long been subjects of interest to the uninformed, who imagine in their possible utilization, new sources of wealth. Our old friend of the swamps, Asclepias incarnata—with which the writer experimented in cultivation many years ago—is the best of the genus, but its fiber, under most favorable conditions, can only be regarded as a fair hemp substitute, with this drawback, that while the cultivation of the hemp plant, and the preparation of the fiber are known quantities, the true economic value of Asclepias fiber has yet to be determined, and its cultivation has not passed the bounds of experiment.

Any new species of fiber, no matter how good it may be, to make a place for itself must either be found specially adapted to some entirely new use, or it must displace some old commercially established textile, such as flax, hemp, or jute, which have come to be employed, the world over, in the manufacture of certain kinds of goods. The established textiles represent a survival of the fittest—that is to say, through special adaptability to certain uses in manufacture, at a definite cost, they have become so rigidly fixed that to attempt to replace them with something else doubtless would upset the world's textile industries. Ramie is, in many respects, a better fiber than flax, yet ramie has had a hard row to hoe during a third of a century or more, in making a place for itself in manufacture, and, for the most part, has had to conceal its identity, and masquerade as something better known. At a store, recently, I noted some ramie dress goods which were placarded, "Ramie linen," thus offering it as a substitute fiber, when, in fact, in the particular line of goods shown, it ought to have stood on its own merits. Twenty-five years ago in Breton, France, some really high grade fabrics were made from the hemp of the province, which was a large industry. But cotton being better adapted to the manufacture of these fabrics, when cotton goods became cheaper than the same goods made of hemp, the Breton hemp industry went under. If an old established industry could be destroyed in this manner by another old established textile, what chance would there be for a "new" fiber?

It will be readily understood, therefore, how difficult it would be to make a place for the new fiber, even if shown to be valuable. To place it in competition with the established spinning fibers it would need to be superior to them—or be used as an adulterant to cheapen manufacture. If not up to the class of spinning fibers, and seeking a lower place, it would at once find itself in competition with such old established cordage fibers as manila, sisal hemp, New Zealand, or Sunn, where again it would need to show superiority, or find use as a cheap substitute. As a matter of fact, considering our present knowledge of the botany of the world, it is safe to say that the discovery of a really new fiber, if sufficient merit to warrant general utilization, is hardly a possibility. Even if some hitherto unknown species of fiber plant should be found in a remote corner of the globe, the particular characteristics of the family and genus of plants to which it belonged being already known, the relative economic value of the new fiber would be fixed even without experimentation. There might be one chance in a hundred that the new species would show qualities that made it superior to other members of the genus to which it belonged. Out of 150 species of the genus Agave, only three or four species are known as producing fiber of commercial value, the sisal-hemp Agave being the most important.

The world's production of raw wool in 1910 was estimated at 1,318,800 tons, and making allowance for the quantities consumed by local industries in the countries of exportation, the supply available for the manufacturers of Europe and North America was 1,135,000 tons.

Personals

John Hewton, for the past thirty years manager of the Kingston Hosiery Co., Ltd., Kingston, Ont., Canada, died at his home in that city after a lingering illness, having undergone an operation, last spring, at the general hospital. Mr. Newton was highly esteemed in Masonic circles, being a member of the Minden Lodge, 253, Ancient Frontenac, Chapter No. 1. He was a past district deputy grand master of that district and had held high office in the Grand Priory of Knights Templar. He is survived by a widow, two sons and three daughters.

J. B. Broadnax, overseer of spinning at the Springstein Mill, Chester, S. C., has resigned to accept a similar position at the Arcade Mills, Rock Hill, S. C.

Z. V. Gray, formerly employed at the Arcade Mills, Rock Hill, S. C., has accepted a position as overseer of spinning at the Springstein Mill, Chester, S. C.

Ben H. Hardee has accepted the position as overseer of carding at the Glencoe Mills, Columbia, S. C. He comes from the Springstein Mill, Chester, S. C.

R. S. Crawford has succeeded J. H. Abler as overseer of spinning at Alexander City, Ala.

J. H. Knight has accepted the position as overseer of weaving at the Hermitage Mills, Camden, S. C. He comes from Lancaster, S. C.

H. W. Clark has accepted the position as overseer of spinning at the Wadesboro Cotton Mills, Wadesboro, N. C. He comes from Kings Mountain, N. C.

W. B. Richardson, Jr., has been appointed superintendent of the Pickett Mills, High Point, N. C., having resigned as overseer of carding at the Edna Mills, Reidsville, N. C.

J. C. Bowling, overseer of weaving at Cliffside, N. C., has resigned to accept a similar position with the Lancaster Cotton Mills, Lancaster, S. C., a position which he formerly held.

J. W. McElhannon, formerly of Columbus, Ga., has taken charge of the weaving, cloth room and quilling at the Highland Park Mills, Rock Hill, S. C.

S. H. Bevill has accepted his old position as overseer of weaving at the Orr Mill, Anderson, S. C.

F. McAbee has accepted the position as overseer of spinning at the Camperdown Mill, Greenville, S. C.

J. E. Featherstone, overseer of carding at the Lowell Cotton Mills, Lowell, N. C., has resigned to accept a similar position with the Sevier Mfg. Co., Kings Mountain, N. C.

J. W. Freeman, formerly of Aragon, Ga., has accepted the position as overseer of carding at the Echota Mills, Calhoun, Ga.

S. S. Kelly, superintendent of the Georgia Mfg. Co., Gainesville, Ga., has resigned and will accept a similar position with the Atlanta Woolen Mills, Atlanta, Ga.

M. E. Bean has accepted the position as overseer of carding at the Lynchburg Cotton Mills, Lynchburg, Va.

T. P. Olmstead has been appointed superintendent of the Baltic Mills, American Woolen Co., Enfield, N. H.

William E. Sharples, superintendent of the Troy Cotton & Woolen Mfg. Co., Fall River, Mass., has severed his connection with that company after 38 years of service. He is succeeded by Alfred Britland, who held the position of overseer of spinning.

W. S. Lowe, superintendent of the Lowell Hosiery Co., Lowell, Mass., has severed his connection with that company.

W. S. Williams, who has been for some time associated with Arthur D. Little, Inc., has recently resigned his position to accept an attractive opportunity in mill work.

Henry McCusker, agent of the Lewiston Bleachery & Dye Works, Lewiston, Me., has resigned to become agent and general manager of the large plant at Wappinger's Falls, N. Y., known as the Garner Print Works & Bleachery.

Arthur Maginnis has severed his connection with the Pacific Mills, Lawrence, Mass. The employes of the finishing department presented him with a traveling bag and a meerschaum pipe in recognition of the good service and kind feeling toward him.

D. P. Mills, for thirty-six years agent of the Dunham Hosiery Co., Naugatuck, Conn., has severed his connection with that company.

Charles Andrews, foreman of the boarding department at the G. H. Tilton & Son Hosiery Mill, Laconia, N. H., has resigned.

F. B. Rollinson, superintendent of the North Adams Mfg. Co., North Adams, Mass., has tendered his resignation to accept a similar position with the Globe Mill, Utica, N. Y.

James A. Clark, overseer of carding at the Germania Mill, Holyoke, Mass., has severed his connection with that company. He was presented with a watch, chain and charm by his fellow employes.

John Leary, overseer of finishing at the George H. Gilbert Mfg. Co., Gilbertville, Mass., has severed his connection with that company.

Michael Coakley has been appointed assistant overseer of weaving at the Pontoosuc Woolen Mfg. Co., Pittsfield, Mass.

Fred Milns has accepted the position as overseer of carding at the Garland Woolen Co., Staffordville, Conn., succeeding Jos. B. Charlesworth.

H. V. Martin, superintendent of the I. E. Palmer Co., Middletown, Conn., for the past six years, has tendered his resignation.

George F. Maguire, overseer of carding at the Homestead Woolen Co., West Swanzy, N. H., has been promoted to the position of assistant superintendent of that company.

Charles Greenwood, designer at the Waterhouse & Howard Mill, North Adams, Mass., has resigned to accept a positon as supeirintendent of the N. K. Regar Mfg. Co., Coral and East Boston Aves., Philadelphia, Pa. Mr. Greenwood was at one time superintendent of the Mayflower Worsted Mills, North Adams, Mass.

H. F. Sherman, superintendent of the jute mill of the Columbia Rope Co., Auburn, N. Y., has resigned.

Captain Amos Bartlett, for many years identified with the S. Slater & Sons Mill, Inc., at Webster, Mass., and trustee in the will of the late Horatio N. Slater, late owner of the mill, has severed his connection with this company.

Frank P. Smith, overseer of weaving at the Hamilton Mfg. Co., Lowell, Mass., has resigned. He was presented with a purse of gold and a dress suit case by the employes of the weaving department. He has accepted a position in one of the large mills in New Bedford, Mass.

Allen McNab, superintendent of the Centreville Cotton Mills, Centreville, R. I., has severed his connection with that company to accept a position with the Lockwood, Greene Co., Boston, Mass.

Adolph Loewenthal, vice-president of the Lion-dale Bleach, Dye & Print Works, Rockaway, N. J., died at his home in New York City, of a complication of diseases. He was 53 years of age and is survived by a wife and two daughters.

J. M. Allen has been appointed superintendent of the Fay Stocking Co., Elyria, O. He comes from Utica, N. Y.

George F. Payne has been appointed superintendent of the Consolidated Cotton Duck Co., Baltimore, Md. He was formerly employed at the Harmony Mills, Cohoes, N. Y.

Alexander Thompson, for a number of years overseer of the finishing department at the Park Hill Mfg. Co., Fitchburg, Mass., died in Salem, Mass., on April 22.

George E. Schultz, superintendent of the bleachery department of the Manville Co., Manville, R. I., has resigned. On his retirement he was presented with a silver punch bowl and cup to match by the employes of the bleachery department.

James W. Holt, master mechanic at the Anderson Mill, American Woolen Co., Skowhegan, Me., has served his connection with that company after 31 years of service.

George W. Gerry has accepted the position as superintendent of the Franklin Yarn Co., Franklin, Mass. Mr. Gerry will have the superintendency over the night force.

Thomas Long has accepted the position as superintendent of the Easton Finishing Co., Easton, Pa. He was formerly employed at the Forestdale Mfg. Co., Forestdale, R. I.

Henry Boardman, agent of the Waldrich Bleachery, Delawanna, N. J., has severed his connection with that company to accept a similar position with the Manville Co., Manville, R. I.

Harry Richardson, superintendent of the Saratoga Victory Mfg. Co., Victory Mills, N. Y., has been appointed agent to succeed H. E. Fisher.

Thomas H. Holliday has been appointed overseer of weaving at the Vassalboro Mills, American Woolen Co., North Vassalboro, Me.

Millard F. Dobson, Jr., has accepted the position as superintendent of the E. W. Sutton Mill, Brooklyn, N. Y., manufacturers of carpet linings. He was formerly employed at the A. H. & C. B. Alling Co., Derby, Conn.

W. R. Thompson has been appointed superintendent of the Palmetto Cotton Mills, Palmetto, Ga., having resigned a position as overseer of carding at the Milstead Mills, Millstead, Ga.

J. F. Pennington, formerly superintendent of the Georgia Mfg. Co., Dublin, Ga., has accepted a similar position with the Raeford Power & Mfg. Co., Raeford, N. C.

Charles A. Fisher, designer at the Fisher Mfg. Co., Fisherville, Mass., has been appointed superintendent of this company.

Eugene J. Bourque, overseer of spinning at the Locustville Woolen Co., Hope Valley, R. I., has severed his connection with that company.

A. E. Schoon has accepted the position as overseer of twisting at the Boott Mill, Lowell, Mass. He was formerly employed at the U. S. Bunting Co., same city.

Thomas B. Umpleby, superintendent and designer for J. A. Humphrey & Sons, Moncton, N. B., Canada, has severed his connection with that company.

J. S. Lamb has accepted the position of overseer of weaving at the Union Cotton Mills, La-Fayette, Ga. He comes from Birmingham, Ala.

W. P. Burt, overseer of carding at the Locke Mills, Concord, N. C., has resigned.

R. S. Crawford has accepted the position as overseer of spinning at the Alexander City Cotton Mills, Alexander City, Ala.

Alfred Pepler, overseer of dyeing at the Aetna Mills, Watertown, Mass., has severed his connection with that company.

Albert J. Cole, overseer of finishing at the H. T. Murdock & Co.'s mill, Proctorsville, Vt., has severed his connection with that company.

F. H. F. Ballou has accepted the position as overseer of finishing at the Fidelity Finishing Works, Hancock, Turner and Mascher Sts., Philadelphia, Pa. He was formerly employed for William Wood & Co., 22nd and Spring Garden Sts., same city.

C. H. Hammond has accepted the position as overseer of carding at the Fidelity Mfg. Co., Charlotte, N. C. He comes from Fort Mill, S. C.

J. E. Jones, overseer of spinning at the Payne Mills, Macon, Ga., has resigned to accept a similar position at the Trio Mfg. Co., Forsyth, Ga.

J. W. Prim has accepted the position as overseer of weaving at the Cowikee Mills, Eufaula, Ala.

W. E. Tisdale, formerly employed at the Dilling Mills, Kings Mountain, N. C., has accepted a position as overseer of carding at the Sevier Mills of the same place.

Willis W. Gray has accepted the position as overseer of spinning at the Locustville Woolen Co., Hope Valley, R. I. He was formerly employed at Coscob, Conn.

George Hammer, for over twenty-five years superintendent of the broad silk department of the Adelaide Mills, Allentown, Pa., has tendered his resignation to take effect July 1.

C. W. Weiss, superintendent of the Arlington Silk Co., New York City, has severed his connection with that company.

Thomas P. Connor has been appointed superintendent of the Wisconsin State Prison, Waupun, Wis., in the binder twine department. He was formerly employed at Peterboro, Ont., Canada.

Moses Pickles, overseer of the drawing department at the Valley Worsted Mill, American Woolen Co., Providence, R. I., has severed his connection with that company. He was presented with a handsome gold watch, suitably engraved and the presentation was made by John McLay, superintendent of the mill.

Edward Lynch, overseer of spinning at the Anderson Mills, American Woolen Co., Skowhegan, Me., has severed his connection with that company. He had been 28 years in the employ of this company.

C. H. Fish, general manager of the Garner Print Works & Bleachery, Wappinger's Falls, N. Y., has severed his connection with that company.

Charles F. McGill, overseer of finishing at the Great Falls Woolen Co., Somersworth, N. H., has severed his connection with that company to accept a similar position with the Newport Woolen Co., Newport, Me.

Daniel Shea has accepted the position as overseer of weaving at the Elmville Mill, S. F. Scott, Uxbridge, Mass. He was formerly employed at the Charles River Woolen Co., North Bellingham, Mass.

E. C. Gammage, superintendent of the Earnsdale Worsted Co., Clinton, Mass., has severed his connection with that company to accept a responsible position with the Paragon Worsted Co., of Providence, R. I.

Charles A. Bellinger, for the past three years overseer of burling and sewing at the Aetna Mills, Watertown, Mass., has severed his connection with that company.

Leonard H. Mellor, overseer of spinning, spooling and warping at the Booth Mfg. Co., New Bedford, Mass., has resigned. The help in his department presented him with a Masonic fob, a box of cigars and a ring.

John Waugh, overseer of carding at the Waverly Woolen Co., Pittsfield, Me., has resigned to accept a similar position with the mill formerly known as the Concord Mfg. Co., Penacook, N. H.

Arthur Goulet, overseer of spinning and twisting at the Pemberton Mill, Lawrence, Mass., has resigned to accept a similar position with the Appleton Mills, Lowell, Mass.

Fred A. Garner, overseer of the cloth department at the Valley Queen Mill, Riverpoint, R. I., has tendered his resignation. He had been in their employ for the past 23 years. Ill health is given for the reason of his resignation.

John Leary has accepted the position as overseer of finishing at the Aetna Mills, Watertown, Mass. He held the position as overseer of finishing for 17 years with the George H. Gilbert Mfg. Co., Gilbertville, Mass.

John Mulligan, overseer of weaving at the South Bend Woolen Co., South Bend, Ind., has severed his connection with that company.

Theodore G. Beckert, designer and assistant superintendent for the past two years at the Sangerville Woolen Co., Sangerville, Me., has severed his connection with that company.

Richard Gough has accepted the position as overseer of weaving at the South Bend Woolen Co., South Bend, Ind. He comes from the Wallace & Smith Blanket Mills, LaPorte, Ind.

Thomas Armitage, overseer of carding at the Tilton Mills, Tilton, N. H., has severed his connection with that company.

Robert McMillan has taken the position as overseer of spinning and winding at the Esmond Mills, Esmond, R. I.

Charles F. O'Gara, superintendent of the Dexter Yarn Co., Pawtucket, R. I., has severed his connection with that company to accept a similar position with the Greene & Daniels Mfg. Co., same city.

Charles L. Macomber has been appointed superintendent of the Winthrop Cotton Yarn Co., Taunton, Mass., to succeed the late Orville Macomber.

Patrick Mulligan, overseer of spinning at the Davis & Brown Mill, Uxbridge, Mass., has severed his connection with that company. He is succeeded by his son, John W. Mulligan.

John E. Denniston has accepted the position as overseer of dressing at the Warren Woolen Co., Stafford Springs, Conn. He formerly held a similar position at the Wuskanut Mills, Farnumsville, Mass.

F. W. Berkenshaw, overseer of finishing at the Aetna Mills, Watertown, Mass., has severed his connection with that company.

James S. Turnbull has accepted the position as designer at the Sangerville Woolen Co., Sangerville, Me.

George Pettengill has accepted the position as overseer of finishing at the Bound Brook Woolen Co., Bound Brook, N. J. He was formerly employed at Raritan, N. J.

S. C. Phillips, overseer of ring spinning, spooling and warping at the Valley Falls Co., Albion, R. I., has resigned to accept a similar position with the Maverick Mill, East Boston, Mass.

W. F. Rawl, formerly overseer of weaving at the Palmetto Cotton Mills, Columbia, S. C., has accepted the position as overseer of weaving, warping and slashing at the Beaver Dam Mills, Edgefield, S. C.

George K. Tate, formerly assistant superintendent of the Roanoke Mills, Roanoke Rapids, N. C., has been appointed manager and superintendent of the New Century Cotton Mills, South Boston, Va.

Edward C. Turner, overseer of weaving, slashing and drawing-in at the Echota Cotton Mills, Calhoun, Ga., has resigned to accept a similar position with the Eastman Cotton Mills, Eastman, Ga.

Lloyd Shinn, formerly of the Central Mills, Sylacauga, Ala., has succeeded A. W. Pitts as overseer of carding at the Buck Creek Mills, Siluria, Ala.

R. T. LeGrande, superintendent of the Palmetto Cotton Mills, Palmetto, Ga., has resigned to accept a similar position with the Brander Mfg. Co., Concord, N. C.

W. J. Allen has accepted the position as superintendent of the Georgia Mfg. Co., Gainesville, Ga. He comes from Egan, Ga.

W. L. Boyd has been appointed overseer of spinning, spooling and warping in Mill No. 2, of the Fort Mill Mfg. Co., Fort Mill, S. C.

C. H. Byers, formerly employed at the Dan River Mills, Danville, Va., has succeeded C. B. Hicks as overseer of carding at the Dixie Mfg. Co., Mooresville, N. C.

Thomas Angus has accepted the position as overseer of finishing at the New York Mills, New York Mills, N. Y. He comes from Wilmington, Del.

H. F. Sisson has been appointed superintendent of the Centreville Cotton Mills, Centreville, R. I., succeeding Allen McNab. Mr. Sisson comes from the Clinton Mills, Woonsocket, R. I. These two mills are operated by the B. B. & R. Knight interest. It is reported that Charles Morton, master mechanic at the Centreville Cotton Mill, will succeed Mr. Sisson at the Clinton Mill.

John Casey has accepted the position as overseer of carding and spinning at the Davenport Woolen Mills Co., Davenport, Ia. He comes from Chatham, Ont., Canada.

W. J. Hallett has been transferred from the Ashley & Bailey Co.'s Mill at Marietta, Pa., to their mill at Fayetteville, N. C., where he will be superintendent.

William A. Theinert, overseer of spinning at the Northern Ohio Blanket Co., Cleveland, O., has severed his connection with that company.

William A. Sale has been appointed designer at the Virginia Woolen Co., Winchester, Va.

James T. Cullen has accepted the position as designer at the Clinton Woolen Co., Clinton, Mich. He comes from Providence, R. I.

Arthur D. Mansell, overseer of finishing at the Newport Woolen Co., Newport, Me., has resigned to accept a similar position with the mill which was formerly known as the Concord Mfg. Co., Penacook, N. H., which is being started.

A. E. McDonald has been appointed superintendent of the J. Frederick Houston & Co.'s mill at Cumberland, N. C.

B. R. Dickson, formerly with the Camperdown Mills, Greenville, S. C., has resigned to accept the position of overseer of carding with the Alice Mills at Easley, S. C.

I. C. Smith has accepted the position as overseer of weaving at the Delgado Mills, Wilmington, N. C., having resigned a similar position with the Hope Mills Mfg. Co., Hope Mills, N. C.

P. M. Keller has been appointed superintendent of the Harden Mfg. Co., Worth, N. C.

J. V. Jones has accepted the position as overseer of spinning at the Great Falls Mfg. Co., Rockingham, N. C., having resigned as second hand of spinning at the Monaghan Mills, Greenville, S. C.

T. L. Currie, formerly of Goldsboro, N. C., has been appointed superintendent of the Hopedale Mills, Burlington, N. C.

N. A. Crawford, overseer of carding at the Coosa River Spinning Co., Bon Air, Ala., has resigned to accept a similar position with the Alexander City Cotton Mills, Alexander City, Ala.

J. B. Bailey has been promoted from second hand to overseer of carding at the Coosa River Spinning Co., Bon Air, Ala

R. A. Fitch, formerly superintendent at Tarboro, N. C., has accepted the position as overseer of weaving at the Roanoke Mills, Roanoke Rapids, N. C.

J. B. Meachum has been appointed superintendent of the Delta Mill, McComb City, Miss. He comes from the Fidelity Mill, Charlotte, N. C.

A. B. Ervin, formerly employed at the Wampum Mill at Lincolnton, N. C., has accepted the position in charge of the carding at the Vivian and Howell Mills at Cherryville, N. C.

Samuel Fisk has taken charge of dressing nights at the Sidney Blumenthal & Co.'s Mill, Shelton, Conn. He was formerly employed at the Riverside Mills, Providence, R. I.

Lan Armitage has accepted a position as overseer of carding at the North Adams Mfg. Co., North Adams, Mass. He comes from Canada.

M. J. Lannon has accepted the position as overseer of finishing at the Auburn Woolen Co., Peterboro, Ont., Canada. He comes from the Allen Woolen Mills, Rochester, N. Y.

Duncan Latimer has accepted the position as overseer of finishing at the North Adams Mfg. Co., North Adams, Mass. He comes from Providence, R. I.

Thomas H. Duggan has accepted the position as overseer of ring spinning at the Chester Spinning Co.

Samuel K. Englehart has accepted the position as overseer of spinning at the Beckman Co., Northern Ohio Blanket Mills, Cleveland, O.

Ernest Sherman has accepted the position as superintendent of the Dexter Yarn Co., Pawtucket, R. I., succeeding Charles E. O'Gara. Mr. Sherman was formerly connected with one of the mills at Pawtucket.

Frank Ricker has accepted the position as overseer of carding at the Tilton Mills, Tilton, N. H. He comes from Sabattus, Me.

E. M. Brown, designer at the Paragon Worsted Co., Providence, R. I., has severed his connection with that company.

Bert Haley has accepted the position as overseer of carding at the Great Falls Woolen Co., Somersworth, N. H.

George H. Snow, superintendent of the Home Mill, Fabyan Woolen Co., Staffordville, Conn., has severed his connection with that company.

Thomas Goulding has accepted the position as overseer of dyeing at the French River Textile Co., Mechanicsville, Conn. He was formerly employed as first assistant dyer at the George H. Gilbert Mfg. Co., Gilbertville, Mass.

Frank H. Elgar has accepted the position as overseer of finishing at the Saxton's River Woolen Co., Saxton's River, Vt. He was formerly employed at the Church's Woolen Mills, Wegatchie, N. Y.

Joseph H. Zens has reorganized the Milwaukee Hosiery Co., Milwaukee, Wis., and is now their president, buyer and manager, he being formerly connected with the Everwear Hosiery Co. since its organization as vice-president and general manager.

William R. Dailey, overseer of dyeing at the French River Textile Co., Mechanicsville, Conn., has severed his connection with that company to accept a similar position with the Aetna Mills, Watertown, Mass.

Frank Scoon, designer at the Earnsdale Worsted Co., Clinton, Mass., has been appointed superintendent and designer at this company.

George Lewis has been appointed superintendent of the North Adams Mfg. Co., North Adams, Mass., to succeed F. B. Rollinson. Mr. Lewis has been assistant superintendent at this mill for some time.

H. E. Fisher, manager of the Saratoga Victory Mfg. Co., Victory Mills, N. Y., has severed his connection with that company.

Edward Bottomley, overseer of finishing at the Wuskanut Mills, Farnumsville, Mass., has severed his connection with that company.

George Gregson has accepted the position as overseer of weaving at the Killingly Mfg. Co., Williamsville, Conn. He was formerly employed at the Samoset Mfg. Co., Central Falls, R. I.

DEATHS.

J. Louis Broughton died at his home in Germantown, Pa., at the age of 52 years. His remains were brought to Blackstone for interment. Mr. Broughton was formerly overseer of burling and sewing at the Blackstone Woolen Co. when this mill was operated by Richard Waterhouse as agent.

George W. Thornton, a resident of Lawrence, Mass., for several years and thirty-two years overseer of the carding department at the Everett Mills, died at his home in West Kennebunk, Me., where he had been a resident for the past two years. He was born in Andover, Mass., 65 years ago and received his education in the Lawrence public schools. He leaves a widow, three brothers and two sisters.

T. Jefferson Coolidge, Jr., one of the best known banking men of Boston, died at his summer home in Manchester by the Sea, at the age of 49 years. He was connected with several banking institutions and several large cotton mills.

Jacob W. Mack, president of the Raritan Woolen Mills and the Somerset Mfg. Co., of Raritan, N. J., died April 11, at the age of 68 years, after a short illness. He was secretary and director of the Nathan Mfg. Co., of New York City and secretary of the Ludlow Valve Mfg. Co.

George Schermerhorn has accepted the position as overseer of spinning at the Chipman Knitting Mills, Easton, Pa.

J. A. Ruth has accepted the position as overseer of knitting at the Elliott Knitting Mills, Hickory, N. C.

William Rufus Mann, one of the oldest citizens of Sharon, Mass., died at his home at the age of 89 years. He was at one time in the Cotton Belting Mfg. Co. at Sharon.

Charles P. Spencer has been appointed agent of the Dunham Hosiery Co., Naugatuck, Conn., succeeding D. P. Mills, who resigned recently.

John W. Robinson, president of the Crex Carpet Co., St. Paul, Minn., died at his home in Hackensack, N. J., at the age of 63 years. A widow and one son survive him.

Solomon Wright, president of the Wright's Health Underwear Co., Troy, N. Y., died at his home recently at the age of 75 years. He is survived by one son.

Mill News

Those interested in receiving early and more complete investigated information of projected new mills, enlargements, improvements, fires, facts and gossip of the trade are referred to the TEXTILE ADVANCE NEWS, issued weekly by the publishers of the TEXTILE WORLD RECORD, at $15.00 per year.

COTTON.

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New Mills.

North Carolina, Charlotte. C. W. Johnston, president of the Highland Park Mfg. Co., is interested in organizing a new company to be known as the Johnston Mfg. Co. for the purpose of building a 5,000-spindle coarse yarn mill in North Charlotte. The stockholders of the new enterprise are stockholders in the Highland Park Mfg. Co. which makes ginghams. Probably 6s to 8s yarns in plies will be made and waste from the mills of the Highland Park Mfg. Co. will be used largely.

North Carolina, Charlotte. O. A. Robbins, treasurer of the new Thayer Mfg. Co. and also the architect-engineer, has completed plans for the plant, and contract for the construction of buildings will be given out within the next two weeks. Twenty-two thousand dollars was paid for a site containing 31 acres at the intersection of the Seaboard Air Line tracks and the Piedmont Northern Electric Railway, seven miles west of Charlotte. The spinning mill will be 2 stories high, 225 ft. long and 150 ft. wide; the weave shed will be 1 story and basement with saw-tooth roof, 210 ft. long by 163 ft. wide. A number of cottages will be built. The company has been incorporated with capital stock of $500,000 and organized with J. T. Lincoln of Fall River, president; O. A. Robbins of Charlotte, treasurer, and Wm. E. Fuller, Jr., Fall River, clerk. Among the directors are Albert A. Jenks and Leon W. Campbell of Pawtucket; C. B. Skipper, who will be superintendent, and John H. Mayes of Charlotte.

*North Carolina, Rhodhiss. Contracts for construction of buildings for the new E. A. Smith Mfg. Co. have been awarded to the Fiske-Carter Construction Co. and call for a main mill, 275 ft. long by 104 ft. wide, 3 stories high, of standard mill construction except in the picker room where columns and floor will be of reinforced concrete; a 1-story cloth room of large dimension to adjoin the main mill. There will be capacity for 15,000 spindles and 400 looms to be operated on heavy drills and sheetings by water power direct by ropes to the shafting. The Shand Engineering Co. of Columbia, S. C., are the architects-engineers. E. A. Smith heads this new company, which has capital stock of $300,000. Mr. Smith recently purchased the holdings of the Hiss Estate in the Rhodhiss Mfg. Co. and is active in the management of that plant. As noted previously, J. W. Kidd will be superintendent of the new mill and the product will be sold by Wilson & Bradbury, who are also selling agents for the Rhodhiss Mfg. Co.

Pennsylvania, Lititz. The Rick Knitting Co. of Reading has established a branch factory at this place to employ about 50 hands. The concern manufactures seamless cotton hosiery.

Pennsylvania, Philadelphia. Gustav Herfurth has leased a portion of the building at the N. W. corner of Mascher St. and Lehigh Ave. in which he will install machinery for the manufacture of full fashioned hosiery. The equipment is now on the way from Europe.

*Rhode Island, Westerly. A charter has been granted the Westerly Textile Co. with capital stock of $100,000 to manufacture and deal in textile fabrics. The incorporators are Fred E. Fowler, Wm. Segar and Chas. Perry of Westerly. Mr. Fowler was formerly secretary of the I. E. Palmer Co., Middletown, Conn., and left that concern April 1 to begin the manufacture of mosquito netting in Westerly. Wm. Segar was owner of the mill property on Main St. which has been acquired by the new corporation, and Chas. Perry is president of the Washington Trust Co., Westerly. The new company will do weaving, dyeing, bleaching and finishing and probably will begin operations about July 1.

Tennessee, Chattanooga. The Southern Aseptic Cotton Co. has been organized and has installed experimental machinery to manufacture absorbent cotton and gauze. It is expected additional equipment will be required. The officers are Robt. T. Cameron, president; R. Meigs Copeland, vice-president; Oswald F. Rothe, superintendent, and Jack Watkins, secretary and treasurer.

*Texas, Post. Final arrangements for the construction of the main building for the new cotton mill of C. W. Post have been made and work will be started at once. The measurements of the main mill have been changed to 520 ft. long by 125 ft. wide, 1 story high, all of reinforced concrete construction and contract for this work has been let. There will be 10,080 spindles and 180 looms for making wide sheetings which will be finished at the plant ready for use. They will build a bleaching plant and electric power plant, details of which have not been fully settled upon.

Washington, Spokane. The Spokane Knitting Mill is a new concern here operating 6 knitting machines and 6 sewing machines on sweaters and similar goods. This company was formerly known as the Greenpoint Mills of Philadelphia and moved here a short time ago.

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Enlargements and Improvements.

Alabama, Huntsville. All of the old cards in Mill No. 1 of the Merrimack Mfg. Co. are to be replaced with improved cards and other changes in the nature of improvements are to be made.

*Canada, Nova Scotia, Yarmouth. In a few weeks, plans will be completed and contracts let for the addition to the plant of the Cosmos Cotton Co. Eight thousand new spindles and about 80 new looms will be installed, requiring 200 additional operatives. This will give a total equip-

ment of 20,000 spindles and 183 looms. G. H. Allen is treasurer, agent and buyer. Cotton duck is manufactured and sold through J. Spencer Turner & Co. of New York.

*Connecticut, Killingly. When changes at the Killing Mfg. Co., formerly the Williamsville Mfg. Co., are completed, they will have 50,000 spindles and 1,000 looms, all new, making practically a new plant. All new floors are being put in, the mill painted throughout and new elevators installed in the new picker building constructed.

Connecticut, Putnam. The shafting is being hung in the mill of the Manhansett Mfg. Co., formerly the mill of the Monohansett Mfg. Co. Some machinery also has arrived, but it will probably be some time before it is running. Excavating for the foundations for the addition that is to be built has been started.

Connecticut, Taftville. Contract has been awarded by the Ponemah Mills for a brick factory addition to cost about $50,000. Recently an addition to the weaving department was built and the looms removed from the weave shed of No. 2 Mill.

Mississippi, Stonewall. A new dyeing and finishing plant is being installed at the Stonewall Cotton Mills. Brown sheetings, shirtings, drills, chambrays and similar goods are manufactured. T. L. Wainwright is president, treasurer and buyer.

Georgia, Columbus. Automobile tire fabrics will be made in the weaving department being established at the local plant of the Bibb Mfg. Co.

*Maryland, Baltimore. Permit has been granted and construction work will be started at once on the new 4-story brick mill of Wm. E. Hooper & Sons Co. The site is on the west side of Parkdale Ave., near the tracks of the Northern Central Railway at Woodberry. As noted previously, the building will practically double the output of the company.

Massachusetts, Housatonic. The Monument Mills are installing in their power plant new equipment consisting of one 500 k. w. turbine, one 7 k. w. motor generator set, one 300 k. w. generator, one 16 k. w. exciter and switchboard. The apparatus is being installed by the General Electric Co.

New Hampshire, Manchester. Changes in the Stark Mills give them equipment of 91,196 ring spindles, 9,040 mule spindles and 2,326 narrow and broad looms. Lewis Dexter is the agent and buyer.

North Carolina, Charlotte. It is reported the Highland Park Mfg. Co. will build an addition, 100 ft. long and install 7,000 spindles.

North Carolina, Dallas. The Monarch Cotton Mills will add 1,000 spindles and has awarded contract for this machinery. Single 30s hosiery yarns are manufactured on present equipment of 6,000 spindles.

*North Carolina, Marion. Contracts for the additions to the Marion Mfg. Co. except for low pressure engine, boilers, belting and mill supplies have been awarded. The company will install 15,000 spindles with 300 looms in the enlargement, as previously noted. J. E. Sirrine of Greenville, N. C., is the architect-engineer.

North Carolina, Mayodan. New electric power equipment is being installed by the Mayo Mills, comprising a water-wheel type generator, exciter, three transformers and switchboard. Throughout the mill they are providing for electric drive by the use of five motors ranging from 30 to 200 h. p. All the apparatus is being obtained from the General Electric Co.

North Carolina, Rockwell. J. W. Cannon has made arrangements to take over the Barringer Mfg. Co. and will increase the capacity of the mill.

Pennsylvania, Chester. A change is being made from steam to electric power in the plant of the Aberfoyle Mfg. Co. Electrical improvements to the extent of approximately $40,000 are being made and include 160 motors of various sizes totalling 1,000 h. p. This change is being made to give flexible operation enabling any particular department to run separately and independently from the rest of the plant.

Pennsylvania, Philadelphia. Baxter, Kelly & Faust, Inc., Tioga and C Sts., manufacturers of cotton plushes with John J. McKenna as superintendent, have increased their looms to 45, all of which are running full. The address of the main office of the company has been changed to 47 and 49 Broome St., New York

Rhode Island, Pawtucket. Greene & Daniels Co., Inc., has organized with Clark W. Holcomb, president, and Henry C. Dexter, treasurer and agent. This is a reorganization of the old Greene & Daniels Mfg. Co. and manufacturing has been started with Chas. E. O'Gara as superintendent. Extensive improvements and additions are planned, including increases in the picking and spinning capacity. The old equipment will be rearranged to insure maximum efficiency and every change made with a view to bringing the plant up-to-date in every particular. Lines of yarns for the tire fabric trade will be added and the company has under contemplation the adding of looms for the weaving of tire cloth. Mr. Dexter buys materials and Mr. O'Gara purchases the mill supplies.

*Rhode Island, Providence. In addition to building a new weave shed at Harris, on which work has been started, the Interlaken Mills will rearrange machinery and build a new power plant. When changes are completed this branch will have a capacity of 35,000 spindles and 800 automatic looms operated by electricity from a new steam turbine and generator of 750 k. w. capacity. They are arranging to drive their spindles by 12 motors ranging from 20 to 100 h. p. All the electric power apparatus is being supplied by the General Electric Co. Enlargements and improvements will be completed by September.

*South Carolina, Easley. The new mill building of the Glenwood Cotton Mills will be 3 stories high, 342 ft. long by 105 ft. wide, and will be constructed of brick. It will have 20,000 spindles, 560 looms and steam power equipment and practically double the present plant which contains 22,000

spindles and 562 looms. At a recent meeting of the stockholders it was voted to increase the capital stock from $240,000 to $600,000. W. M. Hagood is president and treasurer and has charge of the enlargement. C. Frank Grandy of Greenville has the construction contract and J. E. Sirrine is the architect-engineer.

South Carolina, Greenwood. A meeting of stockholders of the Greenwood Cotton Mill will be held at the office of the company on April 30 to consider and vote on the matter of increasing the capital stock to $900,000, the proceeds from the sale of the new stock to be used to increase the capacity of No. 2 Mill by the addition of about 20,000 spindles. No. 2 Mill was planned for 40,000 spindles and its present equipment consists of only 15,000 spindles. If the plans are carried out they will have a total of 50,000 spindles. J. C. Self is president and treasurer and P. D. Wade is superintendent.

South Carolina, Union. The Union-Buffalo Mills Co. will spend about $150,000 to build and equip a steam power plant as an auxiliary of water power of the Broad River. The equipment will include 6 250 h. p. tubular boilers, condensers, pump, 210-ft. smoke stack, etc. Chas. T. Main, Boston, is engineer in charge.

Tennessee, Shelbyville. A weaving plant of 36 looms has been put in operation in what is known as the Victor Mills Bldg., by the Sylvan Cotton Mills. W. J. McGill, treasurer of the company, states that it is not unlikely that the Sylvan Cotton Mills will increase the number of looms in the new plant at an early date.

Virginia, Danville. The Riverside & Dan River Cotton Mills will replace 414 wide looms with 800 automatic looms, and to provide yarn for this increased weaving equipment will add new cards and 10,000 additional spindles. A small addition to the mill will be required and the total cost will be in the neighborhood of $250,000. The directors are considering a plan to build a large new mill, but a definite decision regarding this has not been reached. Current reports that the company plans to invest a million and a half in additional buildings and new equipment are probably based on the contemplated new mill, but the company has not even decided anything definitely in regard to this and has no plans.

Virginia, Roanoke. Three thousand spinning spindles have been ordered by the Twine Mills Corp., and will be installed as soon as received in space that was vacant in the present building. The new equipment is expected to be in operation by July 1. T. J. McNeely is the superintendent and buyer.

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Mills Starting Up.

*Alabama, Selma. The old Cawthon Cotton Mill, which was later known as the Helen Cotton Mills, will be started up by the new owners next week. J. F. Ames, 5606 Euclid Ave., Cleveland, O., purchased the property recently for $70,000. It is understood that Mr. Ames is connected with a bag concern and that bags will be made in the mill.

*Georgia, Forsyth. The Star Cotton Mill, which took over the plant of the Newton-Harp Mfg. Co. some time ago, is manufacturing 4s to 20s yarns on cones, tubes and in skeins. The company has capital stock of $30,000. R. P. Brooks is the president; J. W. Newton, vice-president, and B. F. Hill, Jr., secretary and treasurer.

*Georgia, Griffin. At present full information of the Georgia Cotton Mills, which succeeds the Spalding, Boyd-Mangham and Central Mills cannot be given. A corporation has been organized with paid in capital of $400,000 and is at present owner of the three properties formerly known as the Spalding, Boyd-Mangham and Central Mills. Additional capital will be provided either by the issue of preferred stock or mortgage bonds, just which has not been definitely decided. The officers are Clyde L. King of Atlanta, president; Boling H. Jones of Atlanta, vice-president, and Roswell H. Drake of Griffin, secretary and treasurer. A superintendent has not been selected nor has a selling agent been agreed upon.

Georgia, Lagrange. The new Dunson Mills will begin operations June 1 making ducks, drills and sheetings on 20,000 spindles and 500 looms. Stevens, Sanford & Jordan of New York, will be the selling agents. J. E. Dunson is president; T. J. Thornton, treasurer, and W. S. Dunson, superintendent and buyer.

*North Carolina, High Point. The new Pickett Cotton Mills are practically equipped and manufacturing is expected to be started May 15.

*North Carolina, Salisbury. Organization has been effected by the Princeton Cotton Mills Co. with M. L. Jackson, president and T. B. Marsh, secretary and treasurer. The equipment formerly operated by the Grace Mills, consisting of 36 jacquard looms, has been purchased and manufacturing will be started about the first of May, making 64 and 72-inch damask table covering.

Virginia, Alta Vista. Manufacturing has been started by the new Alta Vista Cotton Mill Co., making fine lawns and fancy cloth from combed yarns. R. L. Cumnock is vice-president and general manager.

WOOLEN.

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New Mills.

Pennsylvania, Philadelphia. Bowman & Ferguson are starting up a plant at Mascher and York Sts. in which they are installing 8 cards and 1,700 mule spindles for manufacturing wool spun cotton yarns, 2 to 20 cut. The production will be sold direct to the weaving and knitting trade.

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Enlargements and Improvements.

Kentucky, Louisville. The capital stock of the Bradford Worsted Spinning Co. has been increased from $250,000 to $500,000 and it is reported the company has decided to make a further increase in the plant, giving a total equipment of 12,000 spindles.

*Massachusetts, Amesbury. In addition to improving the carding department, the Merrimack Hat Co. is building a new dye house. Four sets of cards recently were installed, giving nineteen sets, and a further increase of four or six sets is contemplated. Men's, women's and children's soft wool hats and wool bodies are manufactured. The capital stock is $200,000. H. V. Barrett is president, Geo. W. Emerson, treasurer, and W. H. Hastings, superintendent.

Massachusetts, Fitchburg. The Star Worsted Co. is to enlarge its plant on Sheldon St. by the erection of a 3-story addition, 43 by 77 ft., to be used for manufacturing purposes. Contract has been awarded to Wiley & Thorp, who will begin work very soon. About a year ago the company started the Pitts Mill on Main St. as an annex. Chas. B. Smith is treasurer, agent and buyer and J. F. Moriarty is superintendent. 10s to 50s worsted yarns are manufactured on the Bradford system.

*Massachusetts, Rochdale. Improvements started in December at the plant of E. G. Carlton & Sons have been completed. They include the erection of an addition, rearrangement of the departments and additions to the finishing equipment.

Massachusetts, Ware. Contracts have been let by the Geo. H. Gilbert Mfg. Co. for enlargements to cost $60,000. A brick boiler, engine and pumping house will be constructed, also a brick smoke stack, 180 ft. high, and a concrete trestle, 600 ft. long for handling coal for the factory.

Massachusetts, Worcester. Ten new looms have been bought by the Worcester Woolen Mill Co. and will be installed at an early date. The plant is very busy and all departments are being run to full capacity.

*New Hampshire, East Rochester. Twelve fancy looms have been installed by the Cocheco Woolen Mfg. Co. to take the place of 12 plain looms that have been thrown out. This is the only change being made.

Pennsylvania, Philadelphia. It is reported that the Vervia Worsted Mills, located at Kensington Ave. and Venango St., having secured the cooperation of New York capital, will soon incorporate their business and carry it on on a larger scale. They are manufacturers of worsted goods which they are now selling direct.

Pennsylvania, Philadelphia. Mark D. Ring & Co., spinners of woolen and merino yarns at 3rd and Somerset Sts., report working to their fullest capacity. They have recently been compelled to increase their spindles to 3,864 to enable them to keep up with their orders.

Pennsylvania, Philadelphia. A. J. Gordon & Co., operating the Scotland Mills at Mascher and Somerset Sts., on dress goods, men's wear, oriental pillow slips and couch covers, on 34 narrow looms, report that they are arranging for installation of 14 additional looms to enable them to take care of the many orders on hand. They are very busy.

Pennsylvania, Philadelphia. The Delaine Mills, Inc., Leverington Ave. and High Sts., Manayunk, has changed its officers as follows: H. B. Bosworth, president; William Steele, vice-president and treasurer; T. C. Anderson, secretary. They have also increased their looms to 64, on which they are manufacturing Collingsworth worsteds and report a good business.

Pennsylvania, Philadelphia. The new four-story brick addition, 45 by 150 ft., to the plant of Bush & Terry at Jasper and Thayer Sts., has been completed and will be used for weaving and other purposes. They have recently increased their equipment to 100 looms and others will be put in later on and installed in the new building, where they will be put in operation on the same line of carpets. They sell direct.

Rhode Island, Providence. An enlargement will be built on the present storehouse of the Atlantic Mills which will measure 40 by 80 ft. Recently a wooden storehouse was torn down.

Rhode Island, Providence. An increase has been made in the capacity of the Continental Worsted Co. by the installation of ten large, heavy worsted looms.

Rhode Island, Wakefield. It is reported the Wakefield Mills Co. plans to build an addition to increase the plant. Carded woolen goods are manufactured on 6 sets of cards and 24 looms.

West Virginia, Webster. It is planned to increase the capital stock of the Webster Woolen Mills Co., preparatory to making an increase in the capacity of the plant.

*Wisconsin, Burlington. Little damage was done to the manufacturing plant of the Burlington Blanket Co. by the recent fire which destroyed the storehouses. The buildings burned will be rebuilt at once.

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Mills Starting Up.

Georgia, Rosswell. The old plant of the Laurel Mills Mfg. Co., which was shut down about a year ago, has been leased by the Chattahoochie Woolen Mills and is now running under that name. The plant contains 5 sets of cards and 84 looms.

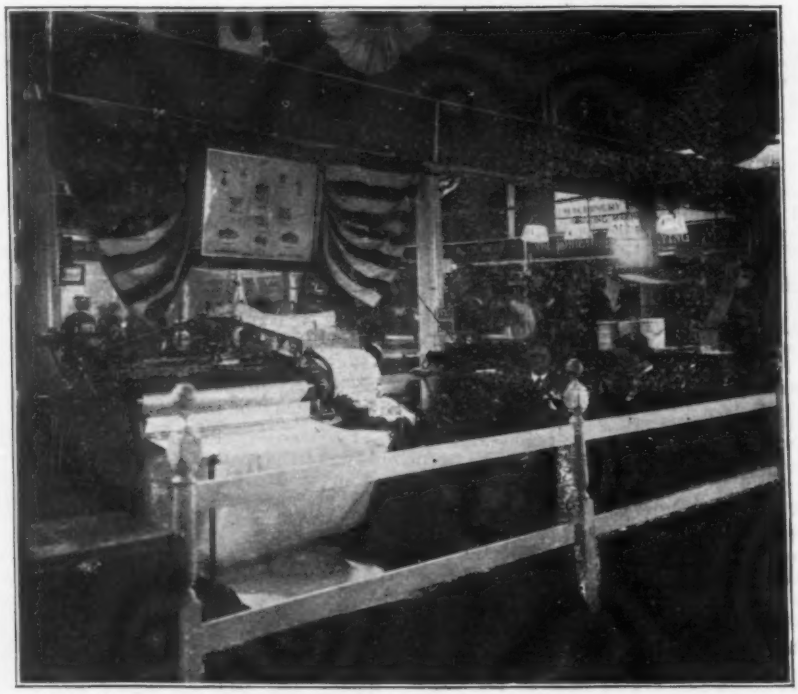
*Indiana, Evansville. Negotiations for the opening of the Evansville Woolen Mills have not been completed, although there seems to be no doubt that the plant will be reopened during the summer. Walter M. Schnitt, the president and treasurer of the old company, expects that the mill will be started up again.

New Hampshire, Penacook. H. W. Brown of West Swanzey, N. H., has taken over the old Concord Mfg. Co. and is starting up the mill. Several months ago Mr. Brown took over the old Granite Woolen Mills of West Swanzey, and is operating them under the name of the Homestead Woolen Co. on white flannels, the output being sold through Parker, Wilder & Co. As noted previously, W. H. Shaw of Killingly, Conn., is the superintendent at Penacook.

The Philadelphia Knitting Machinery Exhibition.

(Continued from page 300.)

J. A. Firsching, Utica, N. Y., had an attractive exhibit showing part of his extensive line of finishing and auxiliary machinery. Machines which attracted special attention were the "1912" cloth cutting, folding, and winding machine; the electrically heated neck marking machine; and the cuff cutting machine. They also showed a buttonhole spacer; lace measuring clock and paraffine device. The cloth cutting machine does in one operation work which was formerly done in two. It cuts the cloth, folds the edges, and rolls them up in one operation, and it is possible to get one more strip out of a bolt of cloth than with the old method of cutting. Mr. Firsching was in attendance during the week.



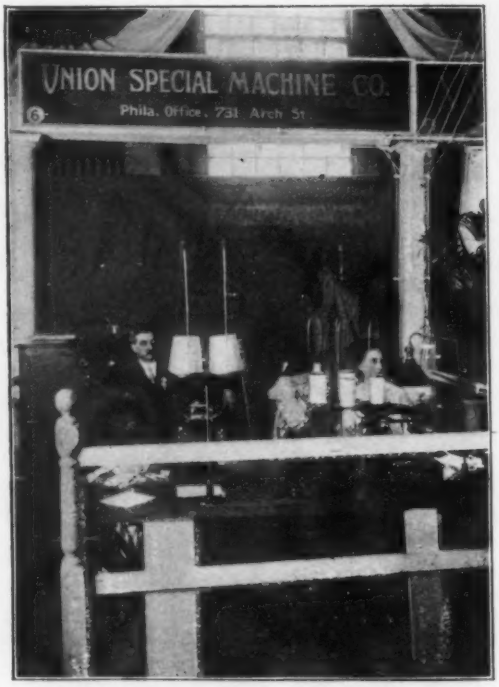
J. A. FIRSCHING.

Henry L. Scott & Co., manufacturers of testing devices, of Providence, R. I., had the same attractive exhibit which they showed in Boston, and which is described elsewhere. This concern has recently issued a handsome new catalogue describing their textile testing instruments.

Andreykovicz & Dunk, one of the oldest established concerns in the dyestuffs business in the country, located at 58 N. Front St., Phila., showed a full line of their products for use in hosiery and knitting mills, consisting of aniline colors, olive oil, soaps, softeners, etc., also a line of colors dyed on silk, cotton and mercerized hosiery, in addition to developed and sulphur blacks.

The International Motor Company, builders of the Mack, Saurer and Hewitt motor trucks, exhibited a one and a half ton truck. This concern had in operation for the benefit of the visitors to the Convention, a Saurer 34 passenger motor truck, which they operated between the Convention Hall and the Hotel Walton, during the hours in which the Convention and the exhibition were in session.

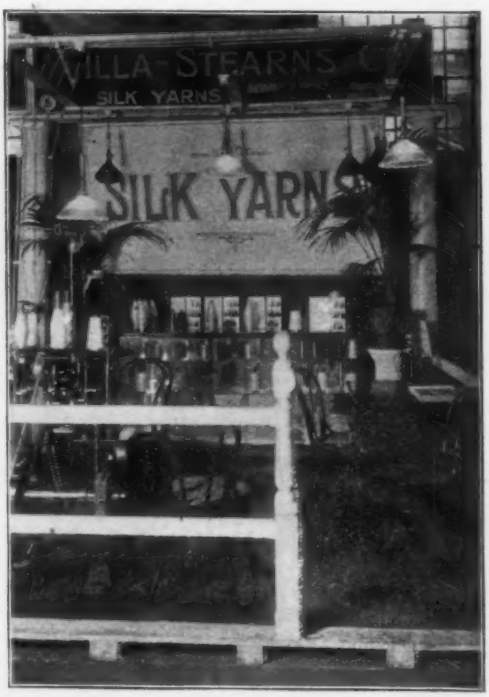
The Union Special Machine Co. exhibited a line of their special machines for the knit goods trade under the auspices of their Philadelphia Office, 731 Arch St. It included a model of their new improved cup teed machine, for seaming selvage edges of full-fashioned hosiery, underwear, neckties, sweaters, etc. Since the original model of this machine was shown last year a number of important changes and improvements have been made. The details of these



THE UNION SPECIAL MACHINE CO.

changes were explained at the exhibition, where the improved machinery was in practical operation. Another machine of interest to underwear manufacturers was the machine class 15100-C, for uniting the tubular border to knit vests, making the figure eight stitch, the finish which seems to be in such popular demand at this time. This machine is capable of a large production.

The Nelite Works of the General Electric Co., formerly the Holophane Co., were represented at the Knit Goods Exhibition by their Industrial Lighting expert, F. M. Scantlebury, who earned for himself and the company the thanks of the exhibitors by the manner in which he attended to their



THE VILLA STEARNS CO.

wants, supplying them with Holophane reflectors for the purpose of illuminating their booths and also explaining the value of these reflectors to the visitors at the show.

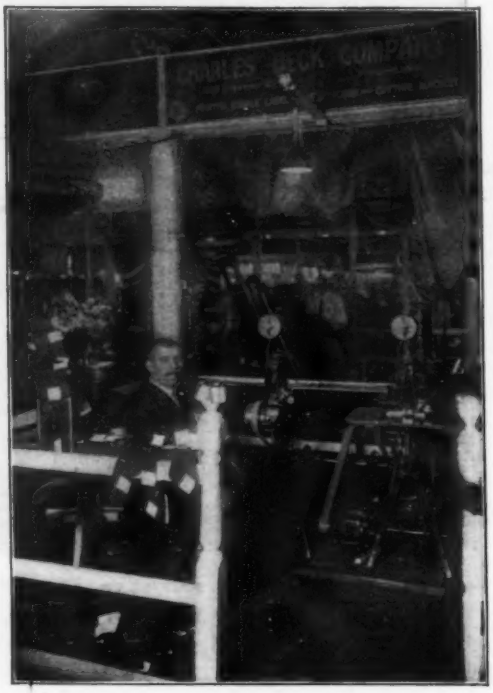
The Villa, Stearns Co., of New York and Philadelphia, had a very attractive space fitted up with a knitting machine in operation on plaited silk hosiery using the line of silk manufactured by them to enable the manufacturer to sell the goods to the retail trade at a price where they could resell it at 25 cents. They also exhibited the various kinds of silk yarns which they handle consisting of Japan, tram, tussah and organzine for knitted neckties, showing the yarns on skeins, tubes and cones. George B. Pfingst of the Philadelphia office of the company and A. A. Herman of the New York office were in charge.

The Grand Rapids Textile Machinery Co, Grand Rapids, Mich., exhibited two very interesting machines, which attracted much attention from manufacturers. In addition to the 28 inch folding machine, they showed a new combination folding and cutting machine, which will take cloth up to 27 inches

GRAND RAPIDS TEXTILE MACHINERY CO.

in width, lay it in folds of any length up to 100 inches, and cut it off at any time the operator so wishes. It can be used for folding alone or for folding and cutting as desired and will cut single folds or the pile as wanted. A combination steam calender and web folder is a recent invention of H. A. Shields to meet a demand for a simple method of handling balbriggan and similar cloth, which was not shown. It gives the goods the same gloss as the old fashioned steam mangle and lays them in smooth, loose folds. All their machines are automatic and require the minimum of attention. H. A. Shields, the inventor, was in charge of the Exhibit with several assistants.

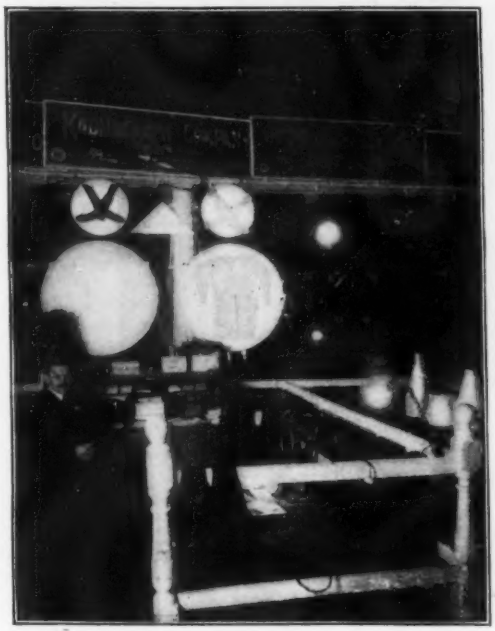
The Charles Beck Company of Philadelphia, showed a Brehmer Pointed Staple Textile Stitcher, and the Keystone Gem Lever Cutter. The stitcher uses a very fine pointed wire, so that the stitches in the fabric are not cut by blunt ends of the wire. It is possible to place this staple through the most delicate fabric without fear of breaking the threads and the stitch may easily be removed by the fingers. We are informed that there are over 60,000 of these stitchers in use in the country today. Several different styles of machines were shown; also the Gem Bench Lever Paper Cutter. Several representatives of the company were in attendance.



THE CHARLES BECK CO.

Wm. H. Lorimer & Sons Co., Philadelphia, mercerizers, dyers and bleachers of cotton yarns, with H. T. Nekevis in charge, exhibited a line of samples of some of the fine work done in their establishment, in colors and naturals, in all sizes and on cones, cops, skeins and in warps.

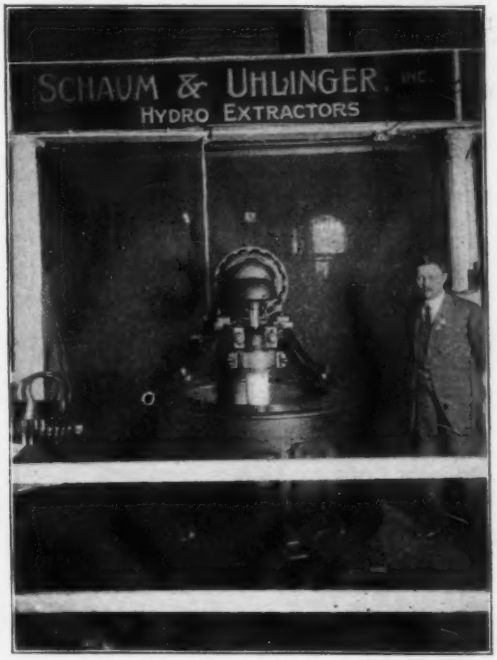
The Kaumagraph Co. of New York, showed their regular line of trade-mark stamps which each year mark an improvement over the preceding product. The particular new thing in this year's exhibit was a two color stamp which is different from anything heretofore produced as it will immediately transfer by one slight pressure of a hot iron, that will come out in two colors or combined with silver and gold at the same time. This new feature is still in the process



THE KAUMAGRAPH CO.

of further development, but enough was shown to demonstrate its attractive features and possibilities. On account of the lack of time they were not able to demonstrate the rapid stamping hosiery machine, which we understand has been perfected for applying trade-marks to hosiery at a remarkably rapid rate.

The Barber-Colman Company of Rockford, Ill., and Boston, Mass., exhibited the latest models of the Barber Knotter, specially constructed for all makes of winders and spoolers. When this knotter was first introduced its principal field was in cotton mills, but in the last few years the knitting trade has come to appreciate its advantages and are now large users of this useful device.



SCHAUM & UHLINGER.

Schaum & Uhlinger, of Philadelphia, exhibited a 42 inch electrically driven hydro extractor of the direct connected, self balancing type. The special features of this machine are safety, speed, simplicity and economy. It is made in various sizes, ranging from 30 up to 60 inches. A large number of these machines are in use in knitting mills.

The Buckeye Electric Works of Cleveland, O., have recently appointed W. O. Conley their Industrial Lighting Manager of their Pittsburgh office. "Buckeye" Conley, as usual, was on hand at the Knit Goods Exhibition in Philadelphia, to look after the interests of the Company and shake hands with their many friends and users of the Buckeye lamps.

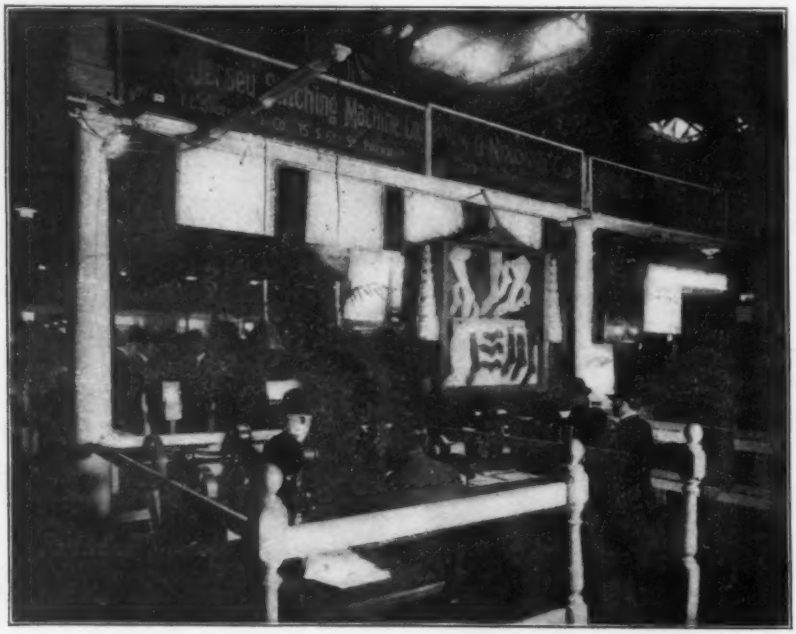
William G. Nixon & Co., 2539 Potter St., Philadelphia, showed a full line of stamps for hosiery and underwear, with inks and pads used by the knitting trade. They also showed their new, brilliant "Gold" stamping ink, which is just brushed on the pad and then stamped on silk and fine gauge hosiery.

The New Jersey Textile Wire Stitcher was shown by J. L. Shoemaker & Co., 15 South 6th St., Philadelphia They had two machines in operation attaching labels to hosiery, underwear, gloves and mittens; with attendants on hand explaining the merits of the machine and the ease with which it could be used.

The following textile journals were represented at the exhibition, occupying tastefully decorated booths in which they received their friends: American Wool & Cotton Reporter, Cotton Publishing Co., Knit Goods, Textile Manufacturers' Journal, and Posselts' Textile Journal and the Textile World Record.

The National Silk Dyeing Co., Paterson, N. J., showed a beautiful line of silk dyed in the skein, also weighted and boiled off for the hosiery and knitting trade. One line of samples showed a remarkable gradation of color, which is known as ombre, beginning with a dark green, shading off through the lighter greens to a pure white and then on through delicate shades of pink and rose to deep red. The gradation was so perfect as to be difficult to determine and showed how delicately and exactly they are able to match any shade. The popularity of silk goods at this time made this exhibit of special interest to manufacturers.

The Beckert Needle & Supply Co. fitted up a booth in an attractive manner for the reception of its customers. C. Walker Jones was on hand to give advice on needle problems. Mr. Jones also had auto service for the purpose of taking interested parties to see other novelties for the knitting trade which he handles.



EXHIBITS OF J. L. SHOEMAKER & CO. AND WILLIAM G. NIXON & CO.

The Nicetown Dye Works, Philadelphia, Pa., exhibited a fine line of samples of dyed hosiery and hosiery yarns in various shades, making a specialty of Hagar's "Intense Black," a color which has made a reputation for their plant, and which today stands as one of the best blacks for hosiery ever attempted.

ROESSLER & HASSLACHER CHEMICAL CO.

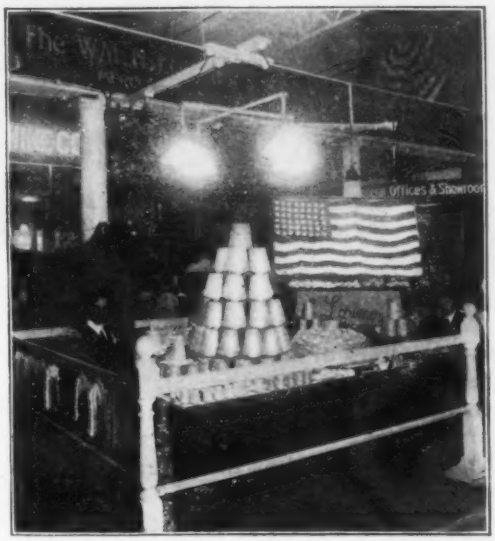
Thomas Wolstenholme Sons & Co., spinners of French and Bradford spun worsted yarns, occupied a booth tastefully decorated in which they received their trade with Mr. Brown and Mr. Schaeffer representing the company.

Roessler & Hasslacher Chemical Co. of New York, gave a practical demonstration in their booth of the advantage of using peroxide of sodium in bleaching textile fabrics, knit goods, etc., of all kinds, whether cotton, wool or worsted. The exhibit was tastefully fitted up with samples of different classes of yarn, goods, hosiery, and underwear, which showed the perfect white produced by this process without weakening.

The Charles Bond Company, 520 Arch St., Philadelphia, manufacturers of transmission

CHARLES BOND CO.

machinery, leather belting and mill supplies, exhibited a line of mill supplies for use in textile plants, including the Veelos Balata



THE WM. H. LORIMER'S SONS CO.

belt, Grundy Patent Insulated coupling for direct connections and all steel oil cans with no soldered joints, the Bond new steel

hanger and other appliances. Mr. Bond also equipped the exhibits in the hall using power, with belting, shafting and hangers, giving a demonstration of the value of these goods in practical use.

The Rhode Island Processing Company, with R. H. Crowell of the Providence Office and W. R. Gillespie, Sr., Secretary, Treasurer and General Manager of the Company, in charge, exhibited a line of cotton yarns, mercerized, dyed and bleached by them. The exhibit consisted of yarn on cones, tubes, skeins, etc.

The Lehigh Valley Silk Mills of South Bethlehem, Pa., represented by Richard A. Blythe, Inc., 308 Chestnut St., Philadelphia, their selling agents, showed as a special feature a silk filature machine in full operation, imported specially from France for the occasion. The machine was operated by Italian women. A machine of this kind has never been exhibited at any of the exhibitions of the Association, in consequence of which the booth was a center of attraction. In addition to the filature machine they had two of the George D. Mayo

INDUSTRIAL THROWN SILK CO., H. M. REMINGTON, AGENT.

McConnell & Co., Ltd., Manchester, Eng., manufacturers of mercerized yarns, through their agent in this country, H. M. Remington of Philadelphia, exhibited a line of fine yarns, making a specialty of 2/79s, showing the yarn being used on the George D. Mayo new model knitter.

Among the visitors to the Exhibition was A. Lance Davis, of Derby, one of the largest knit goods manufacturers in England. Mr. Davis keeps in close touch with the improvements in knitting machinery in this country, and was an interested visitor to the booths of the machine builders.

new "Model B" revolving cylinder knitting machines on both ladies' silk and half hose.

The "Textile World Record's" booth served as a reception room for their friends and customers, and headquarters for members of the staff. Frank L. Nagle, president; Henry G. Lord, treasurer; William J. Flesh, the Philadelphia manager, and D. J. Sandham, were in attendance during the

James Taylor, 121 Arch St., Philadelphia, exhibited the "Philadelphia" grease cup in a variety of styles. He also showed several of his own stop motions for knitting machines.

New Publications

[Any work noticed under this head can be obtained through the office of this journal.]

Technology, Weave Construction, Analysis and Calculations for Jacquard Weaving (Technologie, Bindungslehre, Dekomposition U. Kalkulation der Jacquard Weberei); by Prof. Franz Donat, of the Vienna Textile School; 126 pages and 36 plates, 8 1/2 by 11 1/2; A. Hartleben's Verlag, Vienna and Leipzig. Price $6.

This work consists of two volumes under one cover, the first being the reading matter and the second consisting of illustrations, colored weave drafts and cloth samples. The subject is treated under the following heads: Jacquard weaving, the jacquard loom, weave construction, jacquard designs, pattern making, development of motivs, shading, fabric construction, analysis and calculations. The text is in German. The work is in all respects up to the high standard of the earlier technical books by the same author.

Productive Costs in Cotton Spinning Mills; by Arthur H. Hardman, Associate of the Chartered Institute of Secretaries and Member of the Textile Institute; 119 pages, 4 3/4 by 7 1/4; Emmott & Co., 65 King St., Manchester, Eng. Price $1.50.

A greater part of the contents of this volume was published originally in serial form in the "Textile Manufacturer," of Manchester, Eng. It deals with the subject under the following heads: Estimating Costs, Cotton, Production, Wages, General Expenses, Twist and Weft Yarn Costs, Discount and Profit, Combing, Export Trade Costs, Diagrams, Specimen Costing System. Special attentian is given to the important question of estimating cost, and while the book deals with English methods, American manufacturers can study it with profit.

BUSINESS LITERATURE

Textile Testing; Henry L. Scott & Co., Providence, R. I.

A 38-page catalogue of convenient size giving an illustrated description of the various testing machines manufactured by this company. They include hand operated yarn testers, automatic power yarn testers, hand operated cloth testers, automatic power cloth testers, twist counters, umbrella reels, yarn inspectors, roving reels, yarn reels and roving scales. In addition there are also a number of useful tables giving the breaking strength of yarn and the counts of woolen, cotton and worsted yarn.

Tennessee, Jackson. The plant of the Jackson Woolen Mills has been removed from Jackson to New York City. The concern manufactures clothing. Formerly the cloth was made here, but this branch was discontinued several years ago.

Industrial Notes

HOLOPHANE COMPANY REMOVES TO CLEVELAND

The sales department of the Holophane Company will remove on the 27th of this month from Newark, O., to cleveland, where it will occupy an entire floor of the Vickers building, 66th St. and Euclid Ave.

As previously announced, the Holophane Company and the Fostoria Glass Specialty Company of Fostoria, O., are being merged into one, and is probable that a new name will be given to the combined organization. Definite announcement upon this point has not yet been made. The new organization will manufacture and sell the various lines heretofore listed by both, including Holophane prismatic glass, Veluria, Iris Holophone-D'Olier steel reflectors and numerous specialties. These comprise what is probably the most complete assortment of illuminating glassware offered by any one manufacturer and gives this company a commanding position in the industry. Although all details of the new organization has not yet been worked out, it is known that the sales and engineering departments will be directly in charge of V. R. Lansingh and the manufacturing department under E. O. Cross.

WILL INSTALL TURBO HUMIDIFIERS

The Interlaken Mills at Harris, R. I., recently closed a contract for an installation of 246 turbo heads to cover their old mill and also the new weave shed now under construction. The following day the West Boylston Mfg. Co. of Easthampton, Mass., closed a contract with G. M. Parks Co. of Fitchburg, Mass., the manufacturers of the turbo head, for an installation for 400 of these heads for their new addition.

ANNUAL MEETING OF THE JOSEPH DIXON CRUCIBLE COMPANY

At the annual meeting of the stockholders of the Joseph Dixon Crucible Company held at the company's main office in Jersey City, N. J., Monday the 15th inst., the retiring board of directors, consisting of Geo. T. Smith, William Murray, Edward L. Young, William H. Corbin, Geo. E. Long, William G. Bumsted and Harry Dailey was unanimously reelected.

Officers elected for the ensuing year are as follows: president, Geo. T. Smith; vice-president, W. H. Corbin; treasurer, Geo. E. Long; secretary, Harry Dailey; assistant treasurer and assistant secretary, J. H. Schermerhorn.

There were voted 9,304 shares of a total of 10,000. A number of stockholders attended the meeting and expressed themselves as well pleased with the company's showing and with future prospects.

A NEW FIRM

Robitscher & Rauch have opened an office at 87 Leonard St., New York, and have formed a co-partnership, the members of the firm being Jonas B. Robitscher and Frederick C. Rauch. Mr. Robitscher has been connected with the firm of Alex. Nathan & Co. for over ten years, and Mr. Rauch has also been with the same firm for over six years. They will carry a full line of men's, women's and children's underwear, both in flat and ribbed, and also men's and boys' cotton sweater coats and ladies' knitted skirts.

GRINNELL SPRINKLERS

Fire protection is being taken care of by the General Fire Extinguisher Co. in the shape of an equipment of Grinnell automatic sprinklers. These are supplied by an elevated tank of 50,000 gallons' capacity on a 75-foot tower. Secondary water supplies are obtained from city main and from two fire pumps. The equipment covers not only the new waste and opener building, but also small additions in the old mill, and the renewal of old underground piping in the rearrangement of the hydrant system, bringing the whole thing up to date.

THE ARABOL MFG. CO.

Arabol Gum G, one of the staples of The Arabol Mfg. Co., New York, when used in its pure state gives excellent results in light or heavy sizing of cotton warps and is especially recommended for use on export goods such as China shirtings, drills, denims, coarse or medium goods, etc. It gives starch more volume and adhesive power and adds elasticity and tensile strength.

THE METALINE COMPANY

The corporate name of the North American Metaline Company has been changed to the Metaline Company. This concern has been established for many years at Long Island City, N. Y., and their metalined oil oilless bearings are in very wide use in connection with power transmitting machinery, loose pulleys, counter shafting, and all places where minimum friction with absence of oil or grease is desired.

INSTALLS MORE HYGROSSO

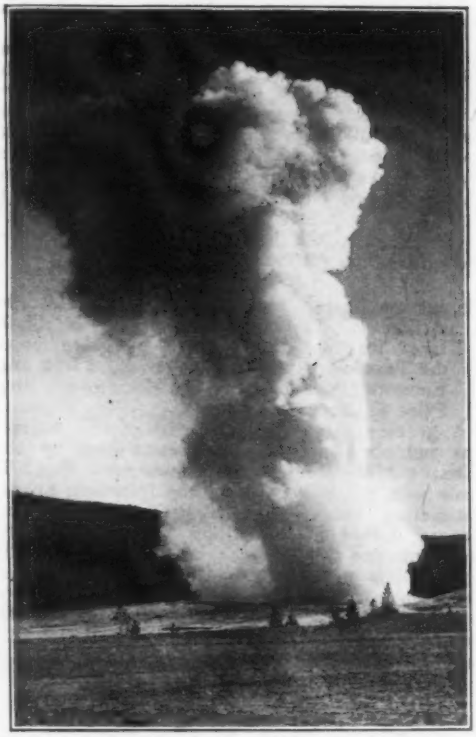
The Manchester Cotton Mills at Rock Hill, S. C., which have had fourteen Hygrosso humidifiers in use for the past fourteen months, have just placed an order with John E. Schott, Charlotte, N. C., the Southern representative for John W. Fries, for twelve additional Hygrosso humidifiers. J. R. Barron is the President and Treasurer of the Manchester Mills.

Among other recent orders received for the Hygrosso humidifiers through their Southern representative, John E. Schott, Charlotte, N. C., have been contracts from the Melville Mfg. Co., Cherryville, N. C., for the equipment of their mill; also for the equipment of the weaving department of the Vivian Cotton Mills at Cherryville. The Gem Yarn Mills at Cornelius, N. C., have placed a contract for the equipment of their mill with Hygrosso humidifiers.

"OLD FAITHFUL"

This striking picture adorns the front page of a circular recently issued by the Tolhurst Machine Works, Troy, N. Y., who have very aptly applied the never failing readiness to do what is expected of it on the part of the Old Faithful Geyser. A brief story of the Geyser is told as follows:

"About the year 1806, Lewis and Clarke's party was returning from its celebrated expedition across



THE "OLD FAITHFUL" GEYSER.

the continent and, when near the mouth of the Yellowstone River, a member, John Colter, asked for and received an honorable discharge. He and his companion, Potts, were captured by Blackfeet Indians. Potts was killed, but Colter miraculously escaped and lived for a year or more among the friendly Bannacks, whose range included what is now the Yellowstone Park. The year 1810 found him back in Missouri telling weird tales about lakes of burning pitch, enormous hot springs and geysers. Even in those days Missouri people had to 'be shown' and they jocularly referred to the region he described as 'Colter's Hell.' Doubtless he was the first white man to see the marvelous Old Faithful Geyser shown on the pre-

ceding page. Since that time, thousands have, in wonder, watched its eruptions, which occur with clock-like regularity every sixty-five minutes.

"From its crater, which is about two feet by six, there is thrown vertically for four and one-half minutes, a great mass of hot water and steam to a height of one hundred and fifty feet, after which all activity ceases for another hour. A century has passed since Colter saw this remarkable Geyser, but in all these years it has never failed to go into action at the expected time, and hour after hour, day and night, summer and winter, it goes on spouting with such certainty that it truly merits its name—Old Faithful."

The circular goes on to state that years have past since W. H. Tolhurst developed the principle of the oscillating step, which makes his Extractor famous, and like the Geyser, "in all these years it has never failed to go into action at the expected time, and hour after hour, day and night, summer and winter, it goes on whizzing with such certainty that it truly merits its name—Old Faithful."

GENERAL ELECTRIC TAKES OVER THE HOLOPHANE

The General Electric Company has recently completed negotiations for taking over the entire Holophane organization consisting of both sales and manufacturing departments. The Fostoria Glass Specialty Company will be united with the Holophane organization, probably in the form of a new company. The sales and engineering parts of the business will be directly under the charge of V. R. Lansingh, while the manufacturing will be under the charge of E. O. Cross.

H. W. JOHNS-MANVILLE CO. IN LARGER QUARTERS

The executive offices and New York show rooms of the H. W. Johns-Manville Co., manufacturers of asbestos, magnesia and electrical supplies, were moved on April 20th to the new 12-story "H. W. Johns-Manville Building," Madison Ave. and 41st St., New York City, from their old quarters at 100 William St., where they have been located for the past 15 years.

This move marks the 54th anniversary of the company. Under the name of H. W. Johns Manufacturing Co., the business was conducted at 87 Maiden Lane, previous to May 1st, 1897, when it was moved to 100 William St. In 1901 the firm name was changed to H. W. Johns-Manville Company, a consolidation being affected between the Manville Covering Co., of Milwaukee, Wis., and H. W. Johns Mfg. Co. This last combination brought together two of the largest manufacturers of pipe and boiler coverings, packings, roofings, etc., in the world, and the growth of the company since that time has been almost phenomenal.

They now have factories located in Brooklyn, N. Y., Milwaukee, Wis., West Milwaukee, Wis., Hartford, Conn., Nashua, N. H., Lockport, N. Y., and Newark, N. J., with an asphalt refinery at South Amboy, N. J.; and extensive asbestos mines at Danville in the Province of Quebec, Canada, which are the largest in existence and produce an exceptionally fine grade of asbestos. They also have a branch house in every city of any size in the United States and Canada, as well as representatives in about all foreign countries.

J. M. SMITH FORMS NEW CONNECTION

J. M. Smith, for several years at the head of The Buckeye Electric Company's industrial lighting department will sever his connection with that company on May 1st, to accept a more important post with the Holophane organization. For over fifteen years the Holophane system of illumination has stood for the scientific application of light to modern commercial needs, and the men in that concern have been pioneers not only as a mill operative but in various manufacturing plants before he "found himself" and started to climb. He knows factory conditions from the inside; he understands the needs and difficulties of the workers, and his recommendations for mill and factory illumination are based upon his intimate knowledge of fact rather than upon a mass of technical theory.

His many friends among the readers of Textile World Record wish him the success he so well deserves.

BRITISH COLONIAL COTTON

From Consul Horace Lee Washington, Liverpool

The steady progress made in the output of British-grown cotton under the auspices of the British Cotton Growing Association is strikingly illustrated in the latest statistics of that association published in the Cotton Yearbook, 1912.

The following is an approximate estimate by the association of the cotton grown more or less directly under its auspices during the past seven years (in bales of 400 pounds) and the sources of production:

	West Africa Bales	East Africa Bales	Approximate Value
1905	4,550	6,650	$729,975
1906	7,500	9,700	1,265,290
1907	11,600	13,300	1,897,935
1908	6,400	16,600	1,751,940
1909	13,600	19,400	2,335,920
1910	7,000	26,700	2,919,900
1911	6,600	48,900	3,503,880

In 1903 the total was 1,900 bales (value, $141,128), and in 1904 it was 5,500 bales (value, $364,987).

THE NATIONAL ASSOCIATION OF WOOL AND WORSTED OVERSEERS

The 30th semi-annual meeting of the National Association of Wool and Worsted Overseers will be held at Providence, R. I., Saturday, May 18. The committee appointed to select a place for the meeting has not reached a decision. Officers will be nominated at the coming meeting.

LOWELL TEXTILE SCHOOL

The graduating exercises of the evening classes at the Lowell Textile School were held on April 24. Addresses were made by A. G. Cumnock, president of the school, and John Jacob Rogers. The certificates were presented by Charles H. Eames, principal of the school, to the following graduates:

Two Years' Cotton Spinning—Wilfred Beech, Albert Courtenay Brainerd, Harry Clinton Brainerd, Charles Dudley Browne, Henry Kendal Dick, Newton Sperry Frothingham, James Royds, Robert Pevey Stevenson, Frederic George Towers, Orrin Hutchins Webster.

Three Years' Worsted Spinning—Walter Fridolf Boije, Harry Lambert, John Charles Lowe, Frank Louis Orrell.

Three Years' Textile Designing—Fred Sherburn Buzzell, Ralph Alfred Dittman, John Augustus Dollbaum, Joseph Henry Higginson, Walter Francis Holland, Alderic Seraphin Lapierre, Edward Thomas Riley, Harold Scott Stevens, Albert Greaves Sugden, Frederic Malcolm Wicks, Joseph Wilkinson.

Three Years' Freehand Drawing—Eugene Blanchette, Ingrid Israella Pihl.

Two Years' Elementary Chemistry—John William Clark, Charles Edward Dulligan, Charles Henry Egan, Ralph William Freeman, Philip Joseph LaPorte, Charles Naylor, Charles Frederic Savage, Victor Emanuel Swanson, Roderick Turgeon.

One Year's Cotton Weaving—Charles Bramley, George Alexander Preble, William Brown Prescott, John Vause, Arthur Silas Wood.

One Year's Woolen and Worsted Weaving—Euthimios Daskalakis, William Henry Donahey, George Edward Hibbert, Joseph Edward Leith, Martin McCann, Joseph Charles Michael, Herbert Haskins Ward.

One Year's Dobby and Jacquard Weaving—Grant Jasper.

Three Years' Elements of Engineering—Arthur John Kerrigan, Chester Wallace Macdonald, Carl Hugo Palm, Henry Stewart Redman.

Three Years' Mechanical Drawing—John Oscar Christenson, John Francis Graves, Arthur Kent, Joseph Michael Muldoon, Russell Purdy Skidmore, Harold Samuel Taylor.

Two Years' Machine Shop Practice—Joseph Emmett Bernard, Emile Blais, Hans Mauritz Hansen, Frank Jackson, John Leontius Lockberg, William Francis Smith.

One Year's Woolen and Worsted Finishing—Walter Fridolf Boije, Thomas Henry Broderick, George Joseph Burke, Goddard Oscar Carlson, Ralph Footman Greenwood, George Tyler Hartshorn, James Charles Hutchings, Henry Edson Rollins, David Douglas Shearer.

VIRTUES OF WORSTED

The shoemaker insists that there's nothing like leather; and certain Bradfordians, prominent in the Chamber of Commerce, reject the idea that there is anything like worsted. Carded woolen, in their perspective, is a poor, shabby, and distant relation, barely deserving acknowledgment from themselves, and quite unworthy of recognition by the Government. Carded woolen—they have tardily discovered—is used for soldiers' wear, and pity is extended towards the troops who have to wear unventilated uniforms made of heavily milled short wool, and are denied the advantage of such cloths as are made in Bradford. In one version, these army goods are not "in many respects as durable or useful as those made from worsted." Indeed all cloths have their defects; and, as far as eye can see, the prime defect of those which an obstinate War Office persists in buying is that they are not made in Bradford, although some are made in its closest environs. Bradford may be to blame for not making the goods for which the specifications call; or, again, the specifications may be at fault for not calling for the goods which are made in the city. Some will think the one thing and some the other; and if all the Chambers of Commerce of all the manufacturing districts address themselves to the War Office, there will perhaps be a chance of arriving at a conclusion.

Presumably it was not the object of the Bradford Chamber to set the denizens of the outer darkness upon their defence; but its measures may have that effect, and their defensiveness may take the form of a critical examination of some of the accusations in the case. The Chamber's activity has its apparent origin in articles in the newspaper Press—articles which we suppose to have been written primarily for American consumption, and only secondarily for the edification of Bradford. The occasion of the articles was the step taken by the United States Army headquarters in replacing worsted by woolen, and so bringing itself into line with the armies of all the world. The initial object being to make out a case for worsted as against woolen, for publication in the private journal of a worsted manufacturers' association, their tenor was something less than impartial. If American readers can be led into accepting the breaking-strain of cloth as an index of its wearing qualities, there are those who cannot, and of them some are to be found even in the Ark of the Covenant, Bradford. It may be observed in passing that none of the Chamber of Commerce speakers mentioned the matter of price. The American authorities effected a very large saving by adopting woolen; and it is useless to blink the fact that worsted uniforms must cost much more than those in present use in our Army. The advantages and disadvantages of woolen and worsted in the long run cannot be discussed apart from price, and the Bradford Chamber of Commerce will be expected to regard matters from the public point of view as well as from that of topographical interests formed in 1892 and the rates of pay after June will be five per cent. above the same. This state of things has never ruled before; indeed, the rate has never exceeded list prices since 1892, nor under the old list that had existed since 1853.—Textile Mercury.

TEXTILE BASEBALL ASSOCIATION

The executive committee of the Textile Baseball Association, an organization formed at the meeting of the National Association of Cotton Manufacturers at Manchester, Vt., last fall, met in Mechanics Building during the show last week and formulated plans for a busy season. This association plans to play the championship series of games during the three days of the Cotton Manufacturers' convention this fall and it is expected that these games will be among the interesting features of the meeting.

The Textile Baseball Association already has about 150 members, and the committee invite applications for active and associate membership from every mill man in the country. Active membership fees are $1 and life memberships $5. The editors of the Textile American, The Textile Manufacturers' Journal, The Textile World Record and Fibre and Fabric will receive and acknowledge membership applications, or they may be sent direct to the committee, R. M. Mackay, chairman, care Stafford Company, Readville, Mass.; M. H. Merrill, the Allis-Chalmers Co., 50 Congress St., Boston, Mass.; F. E. Palmer, the General Electric Company, 84 State St., Boston, Mass., Philip Wentworth, care Draper Co., Hopedale, Mass.; S. H. Steele, Textile Manufacturers' Journal, 377 Broadway, New York City, and Frederic L. Babcock, Fibre and Fabric, 127 Federal St., Boston, Mass.

The Pairpoint Manufacturing Company of New Bedford, Mass., has given a cup for the best batting average. Fibre and Fabric has given a cup for the winning team. The Textile Manufacturers' Journal has furnished masks, gloves, bats, balls, and complete equipment of this character, and a committee has been chosen to select appropriate uniforms.

HOFFMAN PRESS PATENTS SUSTAINED

A decision of interest was rendered by Judge Hollister, of the District Court of the United States, Southern District of Ohio, Western Division, on April 23d, when he decided that the pressing machine manufactured by Edw. C. Grever & Co. is an infringement of the Hoffman patents and of the pressing machine manufactured by the United States Hoffman Company of Syracuse, N. Y.

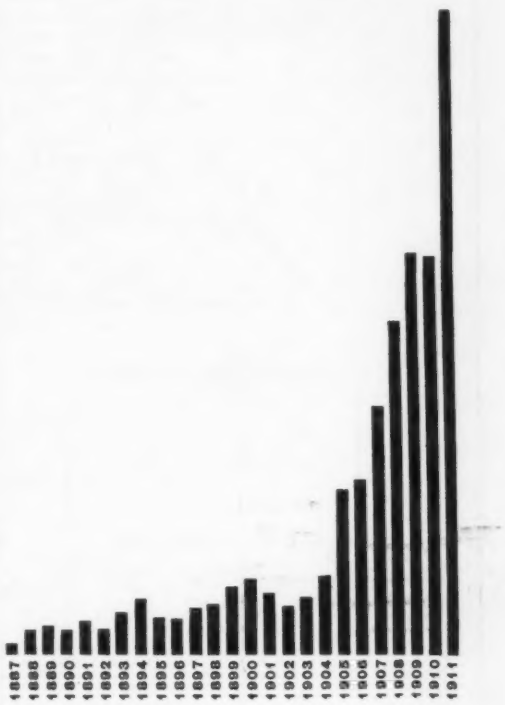
In his decision, Judge Hollister said regarding the Hoffman machine: "No known prior machine could do what this machine does, or was intended to do what it does. It is highly useful. It has found a ready demand in the market. Of course it provoked imitators who followed the usual course of appropriating the virtues of the patent through various disguises and changes in form."

There are sixteen claims made in the Hoffman Patent and Judge Hollister at the close of his decision says: "The conclusion is that Grever's machine infringed all of the claims of Hoffman's patent."

Rhode Island, Providence. The B. & B. Fibre Co. has been incorporated with capital stock of $100,000 to manufacture rope and similar goods.

THE GROWTH OF INDUSTRIAL CHEMISTRY IN RECENT YEARS

It has only been within a comparatively few years that manufacturers and chemists have realized their mutual capacity for helping one another. The pioneer in industrial chemistry was undoubtedly Arthur D. Little, whose business is now incorporated, and whose laboratories at 93 Broad St., Boston, and branches in other parts of the country, are the largest industrial chemical laboratories in this country. Mr. Little has lately been honored with election to the presidency of the American Chemical Society



The increased utilization of chemical research and industry is shown by a chart illustrating the development of his business during the past quarter of a century. It was not until 1905 that the new era of recognition began. Since that time its growth has been remarkable. Mr. Little recently delivered an address on the "Earning Power of Chemistry" before the business men of Indianapolis, which has been reprinted, and would interest any progressive business man.

South Carolina, Greenwood. A preferred stock issue of $105,000 has been voted by the stockholders of the Panola Cotton Mill and president S. H. McGhee is quoted as stating that everything will be in readiness to start up the plant within 60 days.

WATER SUPPLIES FOR AUTOMATIC SPRINKLERS

To secure the best results in insurance reductions, manufacturers find it necessary to have two separate sources of water supply for their sprinkler systems. These are provided, usually, by a choice from the following sources: Reservoir pressure from either public or private mains; an elevated tank; an air pressure tank; underwriters' fire tank; high pressure and low pressure city service. In some cases a satisfactory duplicate supply is obtained by connecting with public water mains on two different streets. The supply pipe through its tank, pump, or water main connection, carries water which is always under pressure.

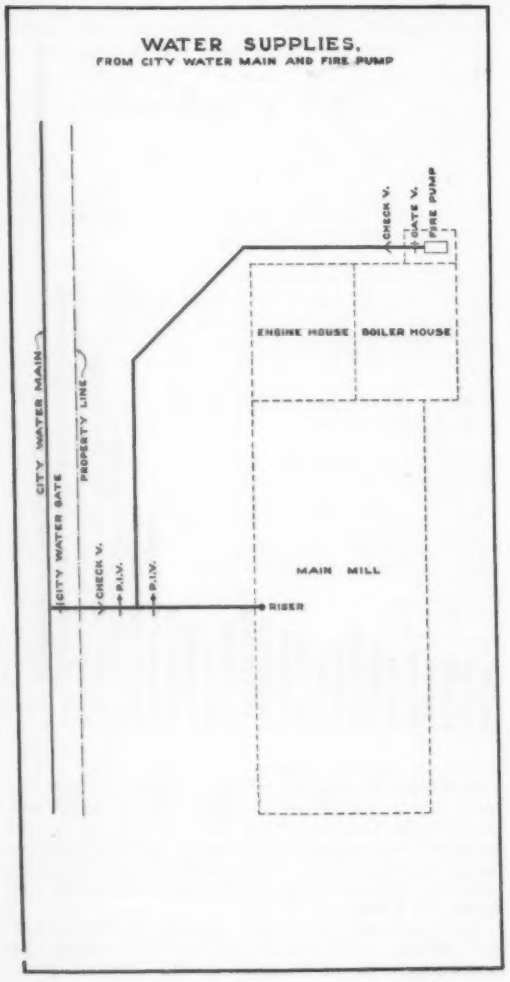


FIG. 1.

In Fig. 1 is shown a plan of underground supply piping (this must be below the frost line to prevent freezing in winter), and general layout of buildings in which the city water main and a fire pump are the sources of supply. The former is shown on the left of the drawing. The connection into the property is shown to pass through a city water works gate on the outside of the property line and a check valve and post indicator valve on the inside. The check valve insures that water cannot be drawn from the private lines into the city main. The post indicator valve controls the water supply to the sprinklers.

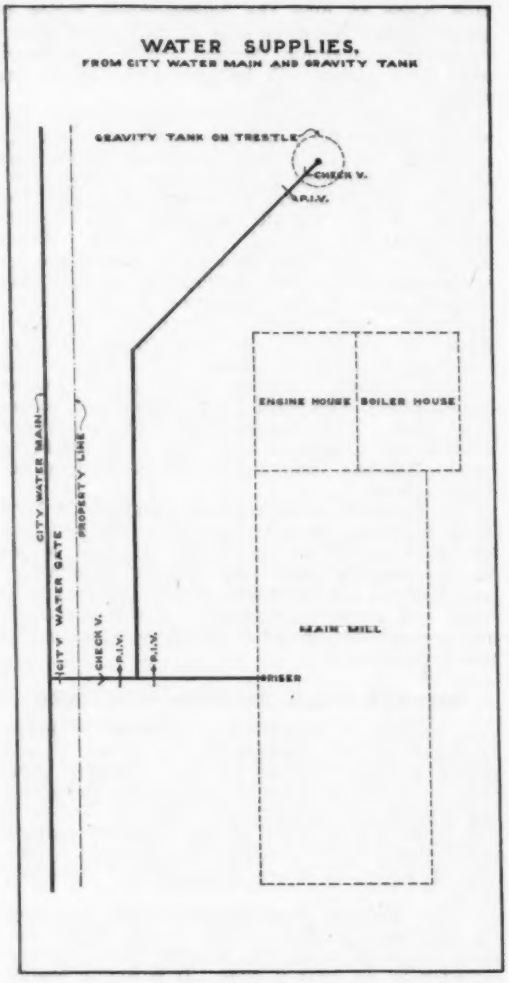


FIG. 2.

The discharge from the fire pump is connected to the underground system as shown, this connection being provided with a check valve near the pump, which prevents the city water pressure from laying on the fire pump.

From the point where the two supplies unite, a

pipe extending into the building to supply the sprinklers is provided, with another post indicator valve for controlling the sprinklers from outside the building. In cases where the building is right on the street the connection to city water runs

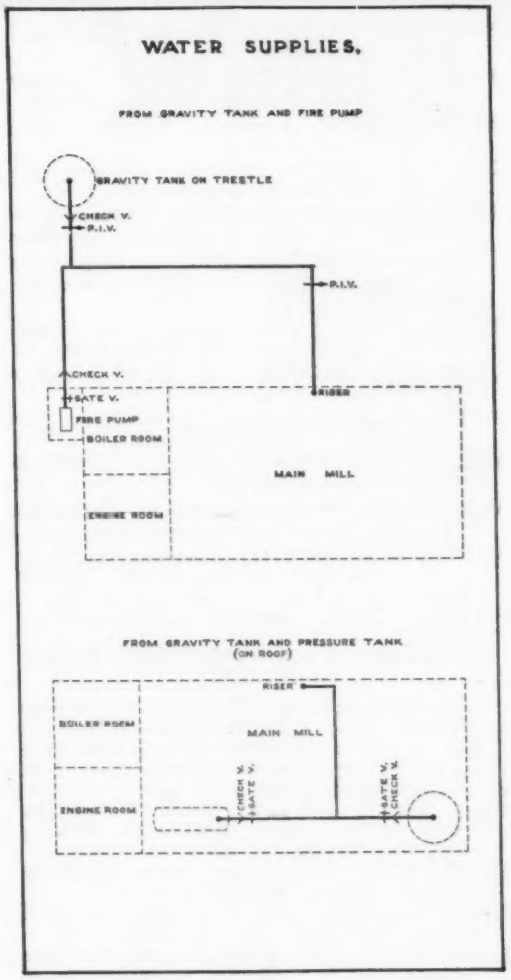


FIG. 3.

directly in and the valve layout is provided for in the basement.

Fig. 2 shows a plan of underground supply pipe and general layout of buildings in which city water main and gravity tank are the water supplies. The city main is indicated at the left, as before, and the connection from the same into the property is indicated by a single line. The city gate is placed at a point near the city water main, and a check valve and post indicator valve are located just inside the property line. A gravity tank (indicated by the dotted circle) located on a trestle or tower, is connected to the city supply as shown. A shut-off valve is placed in the down-pipe from the tank, and a check valve and post indicator valve are shown in the under-ground pipe near the base of the tank riser. From the pipe connecting the supplies, a line is extended into the building for supply to sprinklers.

Fig. 3 shows plans of two similar properties, differently supplied. At the top is shown a layout in which the water supplies consist of a gravity tank and fire pump. The discharge pipes from both are connected to the under-ground system, gates and checks being installed in each as shown. From this underground system a supply pipe is extended into the building. A post indicator valve is placed in this pipe, to control the water supply to the sprinklers.

The lower plan shows a layout having pressure tank and pravity tank as sources of water supply. These are located on the roof of the building, and the tie-up pipe indicated between them is in the top story of the building. A gate valve and a check valve are placed in each supply in the top story, as shown. From the tie-up pipe a supply to the sprinklers is extended across the building, and then to the basement, where connection is made to the sprinkler riser.

REMOVAL OF BOSTON OFFICE

On May 1st the Boston office of the American Diamalt Co. was removed from 226 Essex St. to 200 Summer St. The New England office is in charge of Mitchell Johnson, who is well known to New England mill men.

TWO FIRES ON SAME DAY

The Woodruff Coton Mills had two fires in the breaker room of the picker house, about ninety minutes apart. The first fire caused a slight amount of damage to stock and machinery, while the second broke two glass doors and burned about five pounds of cotton. Each fire was put out by a single Grinnell automatic sprinkler head, no outside assistance being necessary.

THE TEXTILE INDUSTRY'S DEBT TO CHEMISTRY

The relation of chemistry to the clothes we wear is of the first importance, says Arthur D. Little, president of the American Chemical Society, in a recent paper. More land is planted to cotton, and cotton itself is cheaper because chemistry has taught the planter how to secure increased yields by proper fertilization and how to obtain increased profits by utilization of the cottonseed for oil and cattle feed. Chemistry is even now developing new sources of profit for the planter by adapting the short fiber adhering to the ginned cottonseed hull to the making of smokeless powder and the stalks of the cotton plant to paper-making.

The woolen industries are dependent upon chemistry for the processes of separating the pure fiber from the grease and dirt with which it is associated in the raw wool and for the methods of working up this wool waste into oleic acid, soap, lubricating oils and potash and ammonia salts, as well as for the process of carbonizing by which the wool is separated from the burrs and other vegetable material with which it is admixed in the fleece.

Recent Textile Patents

DYEING APPARATUS. 1,021,811. Hermann Windrath, Grevenbroich, Germany.

DYE VAT. 1,022,781. Hermann Friedmann, Elberfeld, Germany.

DYE VAT. 1,023,248. Hermann Friedmann, Elberfeld, Germany.

FABRIC-COATING Machine. 1,023,398. William Salisbury, Stoughton, Mass.

KNITTING FRAME, Straight. 1,023,763. Bruno Salzer, Chemnitz, Germany.

KNITTING SEAMLESS Plated Hosiery. 1,023,313. Emil A. Hirner, Allentown, Pa.

KNITTING MACHINE. Emil A. Hirner, Allentown, Pa.

KNITTING MACHINES, Automatic Take-up Device for Flat. 1,022,233. Carl Goebel, Mulhausen, Germany.

KNITTING MACHINE Drop Stitch Mechanism. 1,021,799. Frank W. Robinson, Reading, Pa.

KNITTED COLLAR for Garments. 1,021,071. George O. Sanborn, Seattle, Wash.

KNITTING MACHINE. 1,021,678. Rowland Hutchinson, Nottingham, England.

KNITTING NEEDLE. 1,022,238. Herbert Heaton, Rockiedge, Pa.

LOOM for Weaving Warp-pile Fabrics. 1,023,537. Charles B. White, Manchester, England.

LOOM AUTOMATIC Stop Motion, Ribbon. 1,022,435. Emil Miller, North Haledon Borough, N. J.

LOOMS for Weaving, Mechanism for Putting Cover on Cloth in. 1,022,229. Nathaniel Fish and Henry Hodgkinson, Darwen, England.

LOOM SHUTTLE Checking Means. 1,021,842. Henry Lussier, Salem, Mass.

LOOM LET Back Mechanism. 1,022,370. Charles Lavalle, New Market, N. H.

LOOM, Weft Replenishing. 1,022,109. Eppa H. Ryon, Worcester, Mass.

LOOMS, Weftparter Device for. 1,023,108. Simeon S. Jackson, Boston, Mass.

LOOM Warping-cleaver. 1,023,703. Benjamin F. Abbott, Lisbon Falls, Me.

MECHANISM for Sewing Machines, Overseaming. 1,023,314. James T. Hogan, Jersey City, N. J.

PLATING DEVICE. 1,023,311. Emil A. Hirner, Allentown, Pa.

SHUTTLE CHECK. 1,023,579. Peter F. Marcante, Allentown, Pa.

SHUTTLE. 1,022,046. Charles Pommier, Passaic, N. J.

SHUTTLE BRAKE. 1,021,199. Jean Laforet, Valence, France.

SPINNING FRAME Creel-supporting Rail. 1,022,193. Lewis T. Houghton, Worcester, Mass.

SPINNING MACHINE. 1,021,448. Edward J. Cotter, Philadelphia, Pa.

STOCKING STRETCHING Device. 1,022,457. Isaac E. York, Waterford, Ontario, Canada.

SPINDLE STOP, Automatic. 1,022,866. Henry M. Norris, Cincinnati, O.

THREAD CUTTING Machine. 1,022,934. Hiland R. Farnsworth, Sandusky, Ohio.

THREAD GUDIE Bars, Driving Mechanism for. 1,023,695. Carl Waltner, Chemnitz, Germany.

THREAD GUIDE Bars, Speed Retarding Device for. 1,033,694. Carl Walther, Chemnitz, Germany.

THREAD GUIDE and Clearing Device. 1,023,578. George F. Macfarlane, Wilkes-Barre, Pa.

THREAD WAXING Device. 1,023,071. Andrew Eppler, Lynn, Mass.

THREADS, Manufacturing Fine Artificial. Carl R. Linkmeyer, Bremen, Germany.

WARPING MACHINE 1,022,755. Festus S. Rand, Providence, R. I.

WARPING MACHINE Stop-motion Mechanism. 1,023,730. Walter J. Garlick, Paterson, N. J.

WINDING APPARATUS, Tension-governor for Yarn. 1,022,979. George Stone, Andover, Mass.

APPLICATIONS FOR REGISTERED TRADE MARKS

These applications have been officially published by the U. S. Patent Office, so that any person who believes a registration would interfere with established rights, may have an opportunity to object within the specified time.

60,833. Spinning and twister rings. Marks: Diamond finish. Owner: Whitinsville Spinning Ring Co., Whitinsville, Mass.

60,971. Woven cotton bags. Mark: Harmony. Owner: Harmony Mills, Cohoes, N. Y.

61,182. Mercerized cotton floss. Mark: R M C. Owner: Richardson Silk Co., Chicago, Ill.

61,392 Cotton piece goods. Mark: Kutmore. Owner: Charles A. Stewart, Rollinsford, N. H.

58,960. Outer shirts, drawers, etc. Mark: Success. Owner: Watts Bros. Co., Lynchburg, Va.

54,258. Cotton dress goods. Mark: Pride of Dixie. Owner: Marshall Field & Co., Chicago, Ill.

60,882. Cotton duck. Mark: Oregon. Owner: Geo. B. Carpenter & Co., Chicago, Ill.

61,340. Handkerchiefs. Mark: Regal. Owner: Heller & Long, New York.

59,656. Hosiery. Mark: Moccasin. Owner: Paramount Knitting Co., Chicago, Ill.

61,468. Flannel Piece Goods. Mark: Lania. Owner: Wick Narrow Fabric Co., Philadelphia.

61,470. Handkerchiefs. Mark: Premier. Owner: Heller & Long, New York.